7-1-2016

Shared Care Contributions to Self-Care and Quality of Life in Chronic Cardiac Patients

Margaret Sebern
Marquette University, margaret.sebern@marquette.edu

Roger Brown
University of Wisconsin–Madison

Patricia Flatley Brennan
University of Wisconsin - Madison

Shared Care Contributions to Self-Care and Quality of Life in Chronic Cardiac Patients

Margaret Sebern

College of Nursing, Marquette University
Milwaukee, WI

Roger Brown

University of Wisconsin–Madison
Madison, WI

Patricia Flatley-Brennan

University of Wisconsin–Madison
Madison, WI

Abstract: Shared care is an interpersonal interaction system composed of communication, decision making, and reciprocity; it is used by patients and family caregivers (care dyads) to exchange social support. This study's purpose was to describe the contributions of shared care to outcomes for individuals with cardiac disease. A secondary data analysis was used to answer the following questions. What is the association between elements of shared care and patient outcomes? Do dyad perceptions of shared care differentially contribute to patient outcomes? Participants in this study were 93 individuals with a cardiac disease and 93 family caregivers. Composite index structured equation modeling was the analytic tool. Caregiver communication and reciprocity were related to patient mental quality of life. Patient communication and reciprocity were related to their own mental and physical quality of life and self-care confidence. Findings from this study

contribute a better understanding of how care dyads are integral to patient outcomes.

Keywords: chronic disease/nursing; social support; cardiovascular disease; cardiac disease; quality of life; caregivers; dyads

Chronic cardiac disease, which includes coronary heart disease (CHD) and heart failure (HF), is a complex clinical syndrome causing enormous morbidity and characterized by a wide range of debilitating symptoms (Roger et al., 2011). More than 15 million people in the United States have CHD, and more than 5.1 million people have HF. CHD causes one in six deaths, and HF one in nine deaths (Go et al., 2013). The care of these patients contributes to escalating health care cost, and family caregivers are considered important to the patient's self-care and quality of life (Heidenreich et al., 2011; Riegel, Moser, et al., 2009). A family caregiver is any person, relative, or friend who provides unpaid assistance to the patient. Family caregivers are integral to patient outcomes; however, few studies have examined how both patients and caregivers contribute to patient outcomes.

Social support often emerges in informal care interactions, such as those between an individual with a chronic illness and a family caregiver (care dyad). By its nature, family care involves two people in a close relationship. One of the authors developed the theoretical foundations of a shared care model depicting informal care interactions used to exchange social support. Shared care was identified in prior work as a system of interpersonal interactions composed of communication, decision making, and reciprocity; it is used by care dyads to exchange social support (Sebern, 2005).

Shared care communication is used to exchange advice, information, and emotional support about an illness experience between members of a care dyad, which shapes the meaning of the situation for them. Decision making is a patient's capacity to seek information and be involved in decisions about his or her care. The patient's evaluation of the situation may be the basis for action, or the caregiver's understanding of the situation may be more important in making treatment decisions. Reciprocity is characterized as partnership and empathy within care dyads.

The Shared Care Instrument–3 (SCI-3) was developed to measure shared care from the perspective of a patient and family caregiver. Examples of SCI-3 items are in Table 1. Confirmatory factor analysis supported the three-factor shared care structure as originally conceptualized for both members of the dyad (Sebern, 2008). This author's preliminary studies with care dyads managing chronic illnesses identified significant associations between shared care factors and self-care, relationship quality, and depressive symptoms (Sebern, 2008; Sebern & Riegel, 2009). An example of shared care is a situation in which a caregiver listens to and verifies a patient's description of symptoms (communication), supports a patient's decision to report symptoms to a primary care provider (decision making), and drives to the drug store to pick up a new prescription (reciprocity). With support from a caregiver, a patient decides to report his or her symptoms to a health care professional (decision making) and expresses gratitude and appreciation for a caregiver's assistance (communication and reciprocity).

Table 1. Examples of Items on Shared Care Instrument–3.

Patient Version	Family Caregiver Version
Communication	Communication
1. There is no one to talk with about how I am feeling.	1. There is no one to talk with about how I am feeling.
2. I don't like to bother my care partner by telling him or her I am feeling sick.	2. I don't like to bother my care partner by telling him or her I am feeling sick.
3. I never ask my care partner for advice about my health problems.	3. I never ask my care partner for advice about my health problems.
Decision making	Decision making
6. When there is something wrong with me, I get as much information as I can about the cause of the problem.	6. When there is something wrong with my family member, she or he gets as much information as she or he can about the cause of the problem.
7. When there is something wrong with me, I do what I can to relieve the symptoms.	7. When there is something wrong with my care partner, she or he does what she or he can to relieve the symptoms.
Reciprocity	Reciprocity
13. We have a partnership.	13. We have a partnership.
14. I would feel bad if my care partner did not tell me about symptoms that are bothering him or her.	14. I would feel bad if my care partner did not tell me about symptoms that are bothering him or her.

Source. Shared Care Instrument–3 (2008) © Sebern http://epublications.marquette.edu/cgi/login.cgi.

The majority of the literature linking social support to patient outcomes looks at individual effects on outcomes, and dyadic effects

are less well understood (Martire, Schulz, Helgeson, Small, & Saghafi, 2010; Schulman-Green et al., 2012). A more holistic understanding of care dyads contributions to patient outcomes will assist clinicians to target interventions that will benefit both members of the dyad (Acitelli & Badr, 2005).

Self-Care and Quality of Life

Self-care in chronic illnesses involves a constellation of processes that requires patients to monitor and respond to symptoms, adhere to treatment, modify lifestyles, and obtain and manage social support (Schulman-Green et al., 2012). Support from a family caregiver may create an environment that fosters self-care or actively contributes to self-care behaviors such as medication adherence (Wu et al., 2013). There is evidence that family caregiver support improves self-care confidence and symptom management (Riegel, Moser, et al., 2009).

Lee and colleagues (2015) identified three patterns of dyadic engagement in HF self-care based on self-care average scores. The first type of dyadic engagement identified was novice and complementary because patients and caregivers contributed to different aspects of self-care that was generally poor. The second type identified was inconsistent and compensatory because caregivers reported greater contributions to the areas of self-care that patients were unable to perform; patients in these dyads had the highest prevalence of hospitalizations. The third type of dyadic engagement was expert and collaborative because of high contributions to all aspects of self-care and the best relationship quality compared with the other archetypes; patients in this archetype were likely the sickest because they also had the worst HF-related quality of life.

Social support is purported to contribute to quality of life. The effects of social support are attributed to better emotional and physiological functioning (Uchino, Carlisle, Birmingham, & Vaughn, 2011). Quality of life is a subjective perception of physical, mental, spiritual, and social well-being (Ferrans, Zerwic, Wilbur, & Larson, 2005). Individuals with chronic cardiac disease are at risk for poor quality of life (Bennett et al., 2001). For example, individuals with cardiac disease have high rates of depressive symptoms. Frasure-

Smith reported that depression is related to cardiac mortality, and the relationship between depression and cardiac mortality decreased with increasing support (Frasure-Smith et al., 2000). Friedmann, Son, Thomas, Chapa, and Lee (2014) reported that poor social support is associated with increased depression over time.

The purpose of this study was to examine how dyadic shared care elements contributed to patient self-care and quality of life. We also examined how within-dyad experiences of shared care differentially contributed to patient outcomes. We developed three models to examine the relationships between dyad communication, decision making and reciprocity, and patient outcomes (Figure 1).
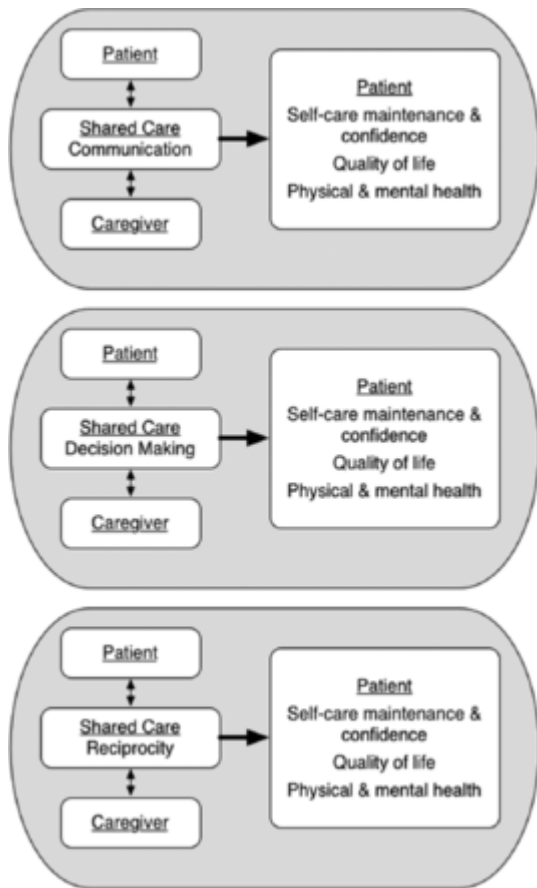

Figure 1. Shared care models.

Research Questions

To examine the associations between separate elements of dyadic shared care and patient self-care and quality of life, we developed the following research questions:

- **Research Question 1 (communication question):** What are the associations between care dyad communication and patient self-care, mental quality of life, and physical quality of life?
- **Research Question 2 (decision-making question):** What are the associations between care dyad decision making and patient self-care, mental quality of life, and physical quality of life?
- **Research Question 3 (reciprocity question):** What are the associations between dyad reciprocity and patient self-care, mental quality of life, and physical quality of life?
- **Research Question 4 (differential contributions to patient outcomes):** Do within-dyad appraisals of shared care differentially contribute to patient outcomes?

Method

This cross-sectional study was a secondary analysis of data collected during a study of 60 nurses and 282 patients with chronic cardiac disease (Brennan et al., 2010). The aim of the original study, Technology Enhanced Practice (TEP), was to describe how a home-care nursing model affected select outcomes of patients with chronic cardiac disease. The results of the TEP study are not discussed here because they are published elsewhere (Brennan et al., 2010). For the study reported here, patients who enrolled in the TEP study were asked to identify an unpaid family member or friend who provided them with the most assistance in managing their chronic cardiac disease and who would like to participate in the shared care study; caregivers chosen in this manner were interviewed and enrolled in this study. This study was conducted using the subset of data available from the parent study on both the patient and his or her family caregiver.

Patients were recruited if they had one of the 120 International Classification of Diseases 9th Revision (ICD-9) coded medical diagnoses indicating the presence of chronic cardiac disease, at least 21 years old, clinically stable, able to read and write in English, and living within a 100-mile radius of the central office for the home-care agency. Caregivers were required to be at least 21 years old, able to read and write in English, and medically stable. Exclusion criteria for patients or caregivers were (a) major co-morbidities, (b) significant sensory or motor disabilities, (c) mental incapacity, or (d) a need for in-home continuous professional care. The recruitment coordinator made clinical judgments to determine whether the patient or caregiver met the exclusion criteria.

Sample size was based on a multiple regression "rule of thumb" calculation of $N \geq (50 + 8m)$, where m is the number of predictors (Green, 1991). Based on two predictors for each regression equation (e.g., patient communication and caregiver communication), the minimum sample size required would be 62 matched dyads for each element of shared care.

Ethical Approval

Human subjects approval was obtained from the University of Wisconsin–Madison and Aurora Health Care Institutional Review Boards. Informed consent from all participants was obtained prior to data collection. To ensure compliance with human subjects procedures, the two above-named institutional review boards also reviewed the secondary analysis research methods reported here.

Measurement

Care partner demographic and shared care data were collected via investigator-developed questionnaires. Patient information about self-care and quality of life were collected using the Self-Care in Heart Failure Index (SCHFI; Riegel, Lee, Dickson, & Carlson, 2009) and Short Form (SF-12) health survey (Ware, Kosinski, & Keller, 1996), respectively. A trained research assistant collected all questionnaire data at baseline enrollment, either in person or on the telephone.

SCI-3

Patient and caregiver versions of the SCI-3 were used to measure shared care processes (Sebern, 2008). The SCI-3 has three separate subscales, Measuring Communication, Decision Making, and Reciprocity. Participants rated their agreement with items on a 6-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (6). The Communication subscale is a five-item scale that measures communication within the dyads. Communication items are reverse scored, because these items are negatively phrased. Examples of patient and caregiver communication items are "there is no one to talk to about how I am feeling" and "I never ask my care partner for advice about my health problems." The coefficient α for patient communication was .85, and .90 for caregiver communication (Sebern & Riegel, 2009).

The Decision Making subscale is a six-item scale that measures level of patient involvement in decisions about his or her care (i.e., "When I am not feeling well, I decide when to call the doctor"). Coefficient α was .83 for both patient and caregiver decision making (Sebern & Riegel, 2009). The Reciprocity subscale is an eight-item scale that measures partnership and empathy related to giving and receiving assistance (i.e., "We have a partnership"). Coefficient α for patient reciprocity was .69, and for caregiver reciprocity was .79 (Sebern & Riegel, 2009). No combined or total score is computed. Higher scores on each subscale indicate more communication, decision making, and reciprocity.

Self-Care

Self-care was measured with the SCHFI (Riegel, Lee, et al., 2009). Based on the recommendation of Dr. Riegel, who developed the SCHFI (email communication, March 19 2009), the investigators measured self-care using two SCHFI scales, Maintenance and Confidence. We did not use the Management scale because it measures only HF symptom management, and thus, it is not appropriate for assessing management of other cardiac symptoms. The SCHFI has adequate internal consistency for self-care maintenance (Cronbach's α = .80) and self-care confidence

(Cronbach's α = .90; Sebern & Riegel, 2009). The SCHFI self-report items are rated on a 4-point Likert-type scale. Summary scores for each scale are standardized on a scale from 0 to 100, with a higher score indicative of better self-care. Riegel reports that scores above 70 reflect adequate self-care for the domain (Riegel, Lee, et al., 2009).

Quality of Life

The SF-12 was used as an indicator of patient quality of life (Ware et al., 1996). SF-12 items were chosen from the SF-36 to represent each of the eight health concepts: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. The SF-12 is based on the assumption that only one or two questionnaire items are necessary to estimate the average score for the eight quality-of-life domains (Resnick & Nahm, 2001). An additive model is used to calculate domains, each scored on a scale from 0 to 100. Scores are transformed to have a mean of 50 and standard deviation of 10 in the general population. A higher score is indicative of a better health state. The SF-12 has an alpha coefficient of .84 for the Physical Quality of Life subscale and .70 for the Mental Quality of Life subscale (Resnick & Nahm, 2001).

Procedures

Participants were 93 matched patient and family caregiver dyads (*N* = 186 participants). Standard demographic and descriptive questionnaires were used at baseline. To correspond with data collection methods used in the original study, research staff conducted interviews of the patient using the SCI-3, SCHFI, and SF-12 during Week 1. If the patient's family caregiver consented to be in the study, separate interviews with the family caregiver were conducted to collect demographic data and SCI-3 data during Week 1. Interviews were conducted either in person or on the telephone.

Data Analysis

Descriptive statistics were obtained to summarize demographic and study variables. To determine the contribution of dyadic shared care to patient self-care and quality of life, we used a Composite Index

Structural Equation model (CISE). A source of measurement error in dyadic data is dependency of data. Data dependency and other sources of measurement error can attenuate parameter estimates (i.e., skewness and kurtosis). Multiple regression assumes independence of data and, thus, is not appropriate to use with dyadic data. CISE allows us to manage dependent data and multiple sources of measurement error and thus strengthen the parameter associations (McDonald, Behson, & Seifert, 2005). CISE provides a number of benefits, such as more stable estimates that fit the data better than item-based counterparts, and it can normalize the distribution. CISE is most useful when the sample is small and there is correlated error variance. In this approach, measurement errors were fixed for the composite indicators to an estimate of the measurement error based on a reliability estimate (Hayduk, 1987). Measurement errors were estimated as one minus the reliability of the scale times its variance. This measurement error term was then assigned to each domain, respectively.

We created three separate CISE models, one for each shared care element, to describe how each element contributed to self-care and quality of life. Shared care composite scores were calculated as an average of the items related to each patient and caregiver shared care domain (e.g., patient communication average, caregiver communication average). We conducted an analysis of the patient and family caregiver shared care composite scores and their associations with SCHFI and SF-12 scales.

We examined how within-dyad appraisals of shared care differentially contributed to patient outcomes. To determine differential contributions to patient outcomes, we tested for statistically significant differences between the shared care unstandardized partial regression coefficients and patient outcomes in each CISE model (Wald test, χ^2 distribution with 1 degree of freedom).

Association between elements of dyadic shared care and patient outcomes were interpreted as suggested by Cohen (1992), who defines .50 as a large correlation, .30 as medium, and .10 as small. Because the purpose of this study was to describe and explain associations between shared care elements and patient outcomes, we used a .10 alpha level to determine statistical significance.

Results

In our study, the typical patient with cardiac disease was a 65-year-old Caucasian, non-Hispanic individuals, with a high school education (Table 2). Forty-seven percent of individuals with cardiac disease were female, and 75% were married. On average, the care dyads had known each other for 39 years. The typical caregiver was a 57-year-old Caucasian female with a high school education. There was a statistically significant difference in age, with caregivers being younger than the patient. Most caregivers were married (83%) and were the patient's spouse or partner (74%).

Table 2. Demographic Characteristics of 93 Matched Dyads.

	Patient (%)	Caregiver (%)
Gender		
Female	47	83
Race		
White	89	90
Black	5	7
Asian	1	2
Hispanic	5	1
Marital status		
Spouse or partner	75	83
Single/widowed	18	11
Single/divorced	5	2
Relation to patient		
Spouse/partner		74
Daughter		16
Son		4
Other		5

Table 2. Demographic Characteristics of 93 Matched Dyads.

Descriptive Statistics for Shared Care, Patient Self-Care, and Quality of Life

The within-dyad correlation for communication was weak ($r = .25$, $p = .09$). However, within-dyad correlation for reciprocity was strong ($r = .61$, $p = .00$). The level of significance for the care dyad's

correlation on decision making was not significant (r = .41, p = .12). The patients had adequate self-care. The mean for self-care maintenance was 84, and the mean for self-care confidence was 75. The mean patient mental quality of life score was 48, near the population mean of 50, but the corresponding score for physical quality of life was 30, below the population mean of 50. These findings suggest that patients had adequate self-care and mental quality of life, but lower levels of physical quality of life.

Care Dyad Communication and Patient Self-Care, Mental Quality of Life, and Physical Quality of Life

Table 3 summarizes the findings for the three CISE shared care models including the unstandardized partial regression coefficients, p values, 95% confidence intervals (CIs), standardized partial regression coefficients, and adjusted R^2 estimates. In the first CISE model, patient and caregiver communication were regressed on self-care maintenance and confidence, mental quality of life, and physical quality of life (Figure 2). Patient communication was significantly associated with patient mental quality of life. In other words, one unit of change in patient communication was associated with a 0.22 (p = .08) standard deviation increase in their mental quality of life (Table 3). Patient communication had an inverse relationship to physical quality of life. In other words, one unit of change in communication was associated with a −0.35 (p = .01) standard deviational change in physical health (Table 3). Caregiver communication positively contributed to patient's mental quality of life. For example, one unit of change in caregiver communication was associated with a 0.29 (p = .01) standard deviation increase in patient mental quality of life (Table 3). Higher levels of dyad communication were associated with better patient mental quality of life. However, patients with higher levels of communication tended to have lower physical quality of life. There was no significant association between communication and self-care maintenance or self-care confidence.

Table 3. Shared Care Effects on Patient Self-Care and Quality of Life (*n* = 93 Matched Patients and Family Caregivers).

	Self-Care Maintenance				Self-Care Confidence				Physical QOL				Mental QOL			
	β [95% CI]	*p*	β*	R²	β [95% CI]	*p*	β*	R²	β [95% CI]	*p*	β*	R²	β [95% CI]	*p*	β*	R²
Communication				.14				.005				.13				.17
Patient	0.06 [−0.05, 0.17]	.28	0.27		−0.01 [−0.17, 0.13]	.83	−0.03		−2.48 [−4.0, −0.59]	.01	**−0.35**		2.16 [−0.29, 4.62]	.08	**0.22**	
Caregiver	0.05 [−0.07, 0.17]	.41	0.20		−0.02 [−0.18, 0.13]	.72	−0.05		1.74 [−0.44, 3.94]	.11	0.22		3.09 [0.69, 5.49]	.01	**0.29**	
Decision making				.09				.17				.19				.13
Patient	0.19 [−0.75, 1.13]	.69	0.20		0.91 [−0.68, 2.50]	.26	0.46		13.34 [−9.36, 36.05]	.25	0.47		7.55 [−6.79, 21.91]	.30	0.19	
Caregiver	0.06 [−0.16, 0.28]	.58	0.15		−0.16 [−0.52, 0.20]	.39	−0.18		−3.36 [−9.08, 2.35]	.25	−0.27		4.08 [−0.79, 8.96]	.10	**0.24**	
Reciprocity				.03				.28				.04				.08
Patient	0.16 [−0.50, 0.83]	.63	0.22		0.95 [0.20, 1.71]	.01	**0.62**		2.43 [−7.68, 12.56]	.63	0.11		−2.91 [−15.83, 10.0]	.65	−0.09	
Caregiver	−0.09 [−0.53, 0.34]	.66	−0.15		−0.22 [−0.75, 0.30]	.40	−0.17		2.07 [−4.93, 9.07]	.56	0.11		8.71 [−1.05, 18.49]	.08	**0.34**	

Note. Bold text indicates significant values. QOL = quality of life; β = unstandardized regression coefficient; CI = confidence interval; β* = standardized regression coefficient; R² = adjusted R².

Table 3. Shared Care Effects on Patient Self-Care and Quality of Life (*n* = 93 Matched Patients and Family Caregivers).
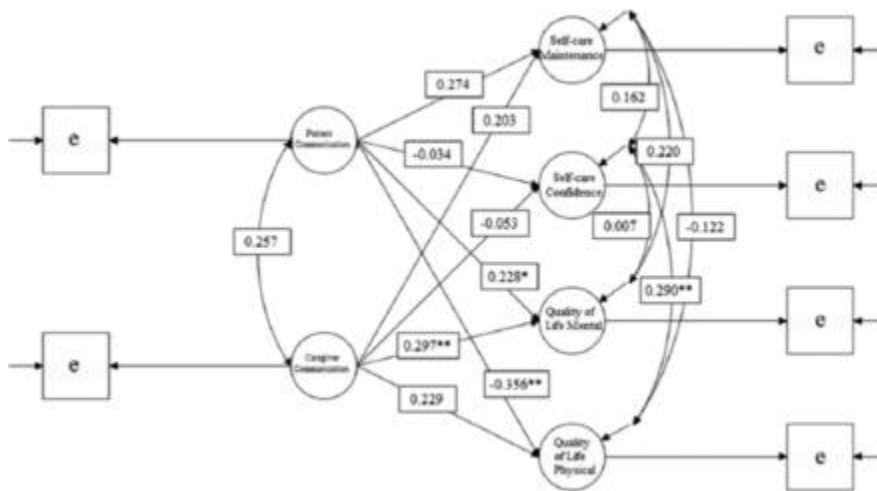

Figure 2. Communication structure equation model.
Note. e = measurement error.
p < .10. **p* < .05.

Care Dyad Decision Making and Patient Self-Care, Mental Quality of Life, and Physical Quality of Life

In our second CISE model, patient and caregiver decision making were regressed on patient self-care, mental quality of life, and physical quality of life (Figure 3). The association between caregiver decision making and patient mental health was marginally significant. For example, one unit of change in caregiver decision making was associated with a 0.24 (*p* = .10) standard deviational increase in mental quality of life (Table 3). Decision making was not significantly associated with self-care or physical quality of life.
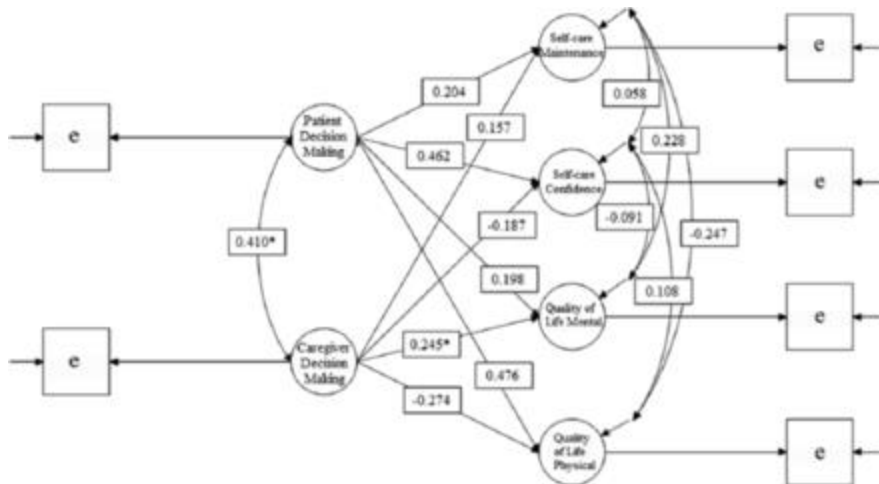
Figure 3. Decision-making structure equation model.
Note. e = measurement error.
*p < .10. **p < .05.

Care Dyad Reciprocity and Patient Self-Care, Mental Quality of Life, and Physical Quality of Life

In our third CISE model, patient and caregiver reciprocity were regressed on self-care, mental quality of life, and physical quality of life (Figure 4). Patient reciprocity contributed to patient self-care confidence. For example, one unit of change in patient reciprocity was associated with a 0.62 (*p* = .01) standard deviational increase in self-care confidence. The caregiver's reciprocity contributed to the patient's mental quality of life. For example, one unit of change in caregiver reciprocity was associated with a 0.34 (*p* = .08) standard deviational increase in patient mental health (Table 3).
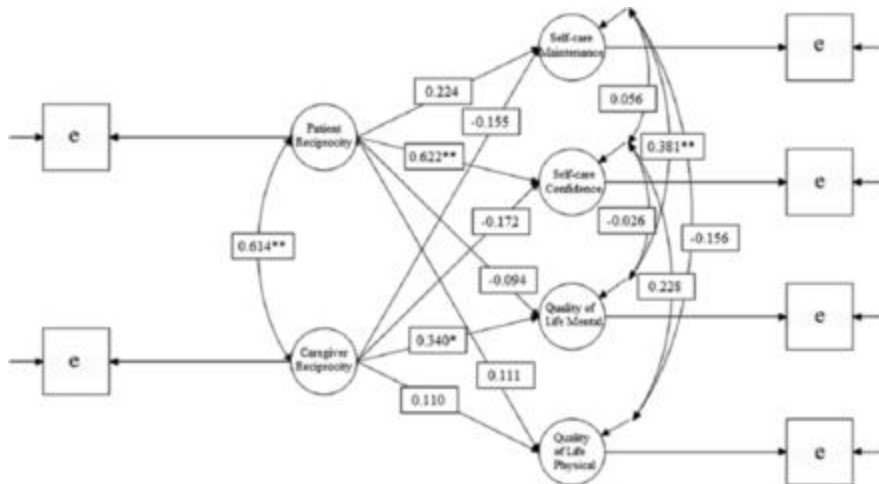
Figure 4. Reciprocity structure equation model.
Note. e = measurement error.
p < .10. **p* < .05.

Within-Dyad Differential Contributions to Patient Outcomes

To determine differential contributions of shared care to patient outcomes, we examined the unstandardized partial regression coefficients between shared care and patient outcomes in each CISE model (Table 4). The unstandardized partial regression coefficients between care dyad communication and physical quality of life were statistically different (Wald test = 6.24, *p* < .01). The unstandardized partial regression coefficient between patient communication and physical quality of life (β = −2.48) was significantly different from the coefficient between caregiver communication and physical quality of life (β = 1.75). The patient communication had a larger inverse relationship with physical quality of life compared with the caregiver communication, which had a smaller, positive, and non-significant relationship with physical quality of life.

Table 4. Parameter Contrasts (Unstandardized Parameter Estimates).

Outcome Measure	Patient Communication	Caregiver Communication	Wald test $\chi^2(1)$	p value
Self-care maintenance	0.064	0.052	0.012	.91
Self-care confidence	−0.017	−0.028	0.008	.93
Physical quality of life	−2.48	1.75	6.24	.01**
Mental quality of life	2.16	3.09	0.247	.61

	Decision Making	Decision Making	Wald test $\chi^2(1)$	p value
Self-care maintenance	0.190	0.064	0.049	.82
Self-care confidence	0.910	−0.161	1.234	.26
Physical quality of life	13.343	−3.364	1.417	.23
Mental quality of life	7.559	4.085	0.152	.69

	Reciprocity	Reciprocity	Wald test $\chi^2(1)$	p value
Self-care maintenance	0.163	−0.097	0.242	.62
Self-care confidence	0.959	−0.227	3.609	.05**
Physical quality of life	2.436	2.070	0.002	.96
Mental quality of life	−2.914	8.719	1.094	.29

$*p < .10. **p < .05.$

The unstandardized partial regression coefficients between patient and caregiver reciprocity and self-care confidence were statistically different (Wald test = 3.61, $p < .05$). The unstandardized partial regression coefficient between patient reciprocity and self-care confidence (β = 0.95) was significantly different from the coefficient between caregiver reciprocity and self-care confidence (β = −0.22). In other words, the patient reciprocity had a larger, positive, and significant relationship to self-care confidence compared with caregiver reciprocity, which had a smaller, inverse, and non-significant relationship with self-care confidence.

Discussion

The purpose of this study was to describe and explain relationships between dyadic shared care elements and patient

outcomes and if dyad shared care differentially contributed to patient outcomes. Our findings supported different patterns for care dyad communication and reciprocity related to patient outcomes. Different patterns between shared care elements and outcomes may be understood in the context of how each patient and caregiver had unique perspectives of shared care. These unique perspectives of shared care had different associations with patient outcomes. Thus, it is important to understand how both members of the care dyad contribute to patient outcomes.

Shared care communication is the exchange of information about an illness experience that shapes the meaning of the situation for the care dyad. Patient communication was important to their physical and mental quality of life, and caregiver communication was important to mental quality of life. However, communication was not associated with self-care, and patient communication had an inverse relationship to physical quality of life. The inverse relationship between communication and physical quality of life may be understood in the context that individuals who experience poor quality of life may communicate more with the caregiver. The inverse association between communication and quality of life was consistent with the findings of Lee and colleagues (2015). These researchers reported that patients with the worst HF-related quality of life had the best relationship quality and lowest caregiver strain compared with the other care dyads.

The unstandardized partial regression coefficients between dyad communication and physical quality of life were statistically different. In other words, the patient's communication had a larger significant inverse association with physical quality of life compared with a caregiver's communication that had a smaller non-significant association with physical quality of life. Improving dyad communication could improve mental quality of life.

The findings in this study are consistent with previous research that supported a relationship between shared care communication and patient mental health. For example, patient communication correlated with components of mental quality of life such as depressive symptoms ($r = .27$, $p < .001$), dyadic relationship strain ($r = .26$, $p < .001$), and self-care confidence ($r = .24$, $p < .02$; Sebern, 2008;

Sebern & Riegel, 2009). The contribution of shared care to mental quality of life is consistent with the social support literature, specifically the relationship between social support and depression. Friedmann and colleagues (2014), in a longitudinal study involving 108 patients with HF, reported a significant interaction between social support and time. These authors found that depression increased over time for patients who reported lower baseline social support. Heo, Lennie, Moser, and Kennedy (2014) studied the influence of social support on physical symptoms, depressive symptoms, and quality of life in a cross-sectional study with a sample of 71 patients. Heo and colleagues reported that emotional support was significantly related to depressive symptoms and quality of life.

Shared care reciprocity is characterized as partnerships and empathy in care dyads. Patient reciprocity was important to patient self-care confidence, and caregiver reciprocity was important to patient mental quality of life. The unstandardized partial regression coefficients between care dyad reciprocity and self-care confidence were statistically different. In other words, patient reciprocity made a larger significant contribution to self-care confidence compared with caregiver reciprocity that made a small non-significant contribution to self-confidence. Thus, improving both patient and caregiver reciprocity may have different positive effects on self-care confidence and mental quality of life.

In prior work, shared care reciprocity was correlated with aspects of patient mental quality of life such as dyadic relationship quality ($r = .49$, $p < .001$), relationship strain ($r = −.30$, $p < .001$), and self-care confidence ($r = .41$, $p < .000$; Sebern, 2008; Sebern & Riegel, 2009). These patterns between shared care elements and outcomes need to be understood in the context of the patient's and caregiver's unique experiences. For example, caregivers who appraise more reciprocity in the relationship may experience less relationship strain and better mental health, and better caregiver mental health may contribute to better patient mental quality of life. Beach and colleagues (2005) reported that a caregiver who is at risk for depression is more likely to engage in behaviors such as screaming and yelling, insulting or swearing that are harmful to a patient's mental and physical quality of life.

The finding that dyad reciprocity is important to self-care confidence is consistent with the social support literature, specifically the relationship between the type and quality of social support and self-care. For example, in a cross-sectional survey of 150 HF patients, emotional and informational social supports were associated with self-care maintenance (Cené et al., 2013). Cené and colleagues reported that self-care confidence mediated the effect of emotional and informational support on self-care maintenance. In other words, the association between emotional/informational support and self-care maintenance was no longer significant when self-care confidence was added to the regression equation. Sayers, Riegel, Pawlowski, Coyne, and Samaha (2008) examined the associations between social support and HF self-care in a cross-sectional study with 74 participants. They reported a statistically significant association for perceived support and self-care confidence, but there was no association with self-care maintenance. Wu and colleagues (2013), in a secondary analysis of two longitudinal studies involving 218 HF patients, reported that perceived social support predicted medication adherence. Gallagher, Luttik, and Jaarsma (2011) conducted a secondary analysis with 333 patients and reported that HF self-care was only associated with high levels of social support.

Our analysis indicated a strong correlation within care dyads for reciprocity ($r = .61$, $p = .00$). Commonalities in reciprocity appraisals may be related to the duration of the care partners' relationships, which in this study averaged 39 years. People in long-term relationships are thought to have more in common and to have multiple opportunities to develop reciprocal relationships, and reciprocity is important to health (Davey & Eggebeen, 1998; Liang, Krause, & Bennett, 2001).

Decision making is defined as a patient's capacity to seek information and be involved in decisions about his or her care. Except for a small association between caregiver decision making and patient mental quality of life, decision making was not significantly associated with patient outcomes. Although patient capacity to make decision is important, the findings from this study also support the important contributions of communication and reciprocity to patient outcomes.

Research implications based on the findings in this study are the following. First, the entire shared care model could be evaluated with a fully powered sample to examine how shared care contributes to outcomes for both members of the care dyad. The shared care model could also be used to develop and test interventions to strengthen shared care in a fully powered study with patients and caregivers managing chronic cardiac diseases.

Practice implications based on the current study are that clinicians could use the shared care model to assess communication, decision making, and reciprocity and then assist the dyad in areas of difficulty. For example, communication skills such as listening, reflecting, paraphrasing, and compromising could be taught if dyads have difficulty sharing information about the illness and emotions with each other. To strengthen reciprocity, dyads could be encouraged to assist each other in areas of need, within the context of their physical limitations. For example, a patient could respond to a caregiver's assistance with gratitude and appreciation, enhancing the caregiver's sense of purpose. Care dyads could also be encouraged to identify and engage in activities they both enjoy, thus strengthening reciprocity.

Several limitations of this study are recognized. First, due to the cross-sectional design, the direction of these relationships and causality cannot be assumed. Second, analysis was limited to the variables for which data were collected for the primary study. Third, we did not have adequate power to test the entire model, and thus analyzed shared care elements separately. Fourth, the majority of participants were non-Hispanic White, with chronic cardiac disease, so the shared care model needs further evaluation with individuals from diverse racial and ethnic populations and with other chronic conditions, including psychiatric illness. Participants also lived in their own residences and were cognitively intact; thus, the findings cannot be generalized to persons who are institutionalized or have cognitive disabilities.

This study contributed to an understanding of how dyadic shared care elements are associated with outcomes in individuals with chronic cardiac disease. Caregiver communication and reciprocity were related to patient mental quality of life. Patient communication and reciprocity were related to their own mental and physical quality of life

and self-care confidence. The evidence from this study supports the importance of assessing communication and reciprocity in care dyads and developing and testing interventions that address areas of difficulty. Interventions that target shared care elements may improve self-care and the quality of life for both members of the dyad. Dyadic intervention research to enhance shared care interactions is currently being investigated by the authors.

Article Notes

Reference

Acitelli L. K., Badr H. J. (2005). My illness or our illness? Attending to the relationship when one partner is ill. In Revenson T. A., Kayser K., Bodenmann G. (Eds.), *Couples coping with stress: Emerging perspectives of dyadic coping* (pp. 121-137). Washington, DC: American Psychological Association.

Beach S. R., Schulz R., Williamson G. M., Miller L. S., Weiner M. F., Lance C. E. (2005). Risk factors for potentially harmful informal caregiver behavior. *Journal of the American Geriatrics Society*, 53(2), 255-261.

Bennett S. J., Perkins S. M., Lane K. A., Deer M., Brater D. C., Murray M. D. (2001). Social support and health-related quality of life in chronic heart failure patients. *Quality of Life Research*, 10, 671-682.

Brennan P. F., Casper G. R., Burke L. J., Johnson K., Brown R., Valdez R. S., . . . Sturgeon B. (2010). Technology-enhanced practice for patients with chronic cardiac disease: Home implementation and evaluation. *Heart & Lung: The Journal of Acute and Critical Care*, 30(6, Suppl.), S34-S46.

Cené C. W., Haymore L. B., Dolan-Soto D., Lin F.-C., Pignone M., DeWalt D. A., Corbie-Smith G. (2013). Self-care confidence mediates the relationship between perceived social support and self-care maintenance in adults with heart failure. *Journal of Cardiac Failure*, 19, 202-210. 10.1016/j.cardfail.2013.01.009

Cohen J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.

Davey A., Eggebeen D. J. (1998). Patterns of intergenerational exchange and mental health. *Journals of Gerontology, Series B: Psychological Sciences & Social Sciences*, 53, 86-95.

Ferrans C. E., Zerwic J. J., Wilbur J. E., Larson J. L. (2005). Conceptual model of health-related quality of life. *Journal of Nursing Scholarship*, 37, 336-342.

Frasure-Smith N., Lesperance F., Gravel G., Masson A., Juneau M., Talajic M., Bourassa M. G. (2000). Social support, depression, and mortality during the first year after myocardial infarction. *Circulation*, 101, 1919-1924.

Friedmann E., Son H., Thomas S. A., Chapa D. W., Lee H. J. (2014). Poor social support is associated with increases in depression but not anxiety over 2 years in heart failure outpatients. *Journal of Cardiovascular Nursing*, 29, 20-28. 10.1097/JCN.0b013e318276fa07

Gallagher R., Luttik M.-L., Jaarsma T. (2011). Social support and self-care in heart failure. *Journal of Cardiovascular Nursing*, 26, 439-445. 10.1097/JCN.0b013e31820984e1

Go A. S., Mozaffarian D., Roger V. L., Benjamin E. J., Berry J. D., Borden W. B., Turner M. B. (2013). Heart disease and stroke statistics—2013 update: A report from the American Heart Association. *Circulation*, 127, e6-e245. 10.1161/CIR.0b013e31828124ad

Green S. B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research*, 26, 499-510.

Hayduk L. (1987). *Structural equation modeling with LISREL*. Baltimore, MD: Johns Hopkins University Press.

Heidenreich P. A., Trogdon J. G., Khavjou O. A., Butler J., Dracup K., Ezekowitz M. D., . . . Woo Y. J. (2011). *Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. Circulation*, 123, 933-944.

Heo S., Lennie T. A., Moser D. K., Kennedy R. L. (2014). Types of social support and their relationships to physical and depressive symptoms and health-related quality of life in patients with heart failure. *Heart & Lung*, 43, 299-305. 10.1016/j.hrtlng.2014.04.015

Lee C. S., Vellone E., Lyons K. S., Cocchieri A., Bidwell J. T., D'Agostino F., Riegel B. (2015). Patterns and predictors of patient and caregiver engagement in heart failure care: A multi-level dyadic study. *International Journal of Nursing Studies*, 52, 588-597. 10.1016/j.ijnurstu.2014.11.005

Liang J., Krause N. M., Bennett J. M. (2001). Social exchange and well-being: Is giving better than receiving? *Psychology and Aging*, 16, 511-523.

Martire L. M., Schulz R., Helgeson V. S., Small B. J., Saghafi E. M. (2010). Review and meta-analysis of couple-oriented interventions for chronic

illness. *Annals of Behavioral Medicine*, 40, 325-342. 10.1007/s12160-010-9216-2

McDonald R. A., Behson S. J., Seifert C. F. (2005). Strategies for dealing with measurement error in multiple regression. Journal of Academy of Business and Economics, 5(3), 80-97.

Resnick B., Nahm E. S. (2001). Reliability and validity testing of the revised 12-item Short-Form Health Survey in older adults. *Journal of Nursing Measurement*, 9, 151-161.

Riegel B., Lee C., Dickson V., Carlson B. (2009). An update on the Self-Care of Heart Failure Index. *Journal of Cardiovascular Nursing*, 24, 485-497.

Riegel B., Moser D. K., Anker S. D., Appel L. J., Dunbar S. B., Grady K. L., Whellan D. J. (2009). State of the science: Promoting self-care in persons with heart failure: A scientific statement from the American Heart Association. *Circulation*, 120, 1141-1163.

Roger V. L., Go A. S., Lloyd-Jones D. M., Adams R. J., Berry J. D., Brown T. M. (2011). Heart disease and stroke statistics—2011 update: A report from the American Heart Association [Erratum appears in Circulation. 2011 Feb 15; 123(6), e240]. *Circulation*, 123(4), e18-e209.

Sayers S. L., Riegel B., Pawlowski S., Coyne J. C., Samaha F. F. (2008). Social support and self-care of patients with heart failure. *Annals of Behavioral Medicine*, 35, 70-79.

Schulman-Green D., Jaser S., Martin F., Alonzo A., Grey M., McCorkle ., Whittemore R. (2012). Processes of self-management in chronic illness. *Journal of Nursing Scholarship*, 44, 136-144. 10.1111/j.1547-5069.2012.01444.x

Sebern M. D. (2005). Shared care, elder and family member skills used to manage burden. *Journal of Advanced Nursing*, 52, 170-179.

Sebern M. D. (2008). Refinement of the Shared Care Instrument–Revised: A measure of a family care interaction. *Journal of Nursing Measurement*, 16, 43-60.

Sebern M. D., Riegel B. (2009). Contributions of supportive relationships to heart failure self-care. *European Journal of Cardiovascular Nursing*, 8, 97-104.

Uchino B. N., Carlisle M., Birmingham W., Vaughn A. A. (2011). Social support and the reactivity hypothesis: Conceptual issues in examining the efficacy of received support during acute psychological stress. *Biological Psychology*, 86, 137-142.

Ware J. E., Kosinski M., Keller S. D. (1996). A 12-Item Short-Form Health Survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, 34, 220-233.

Wu J. R., Frazier S. K., Rayens M. K., Lennie T. A., Chung M. L., Moser D. K. (2013). Medication adherence, social support, and event-free survival

in patients with heart failure. *Health Psychology*, 32, 637-646. 10.1037/a0028527