



Mechanism of engaging self-management behavior in rural heart failure patients



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ABSTRACT

Aim: The purpose of this study was to examine the relationships among self-efficacy, patient activation and SM in rural heart failure patients discharged from critical access hospitals.

Background: Heart failure is one of the most disabling and resource-consuming chronic conditions. Compared to their urban counterparts, rural heart failure patients had higher healthcare utilizations and worse health outcomes. Self-management (SM) plays a significant role in improving patients' outcomes and reducing healthcare use. Despite persistent recommendations of SM, engagement in SM still remains low in rural heart failure patients. SM is a complex behavior, which is influenced by various factors. Evidence on the efficacy of interventions to promote SM is limited and inconsistent. One reason is that the mechanism of engagement of SM in the rural heart failure population has not been fully understood.

Methods: A correlational study was conducted using secondary data from a randomized control trial aimed to improve SM adherence. Path analysis was used to test the hypothesis of patient activation mediating the effect of self-efficacy on SM.

Results: Data were collected from a sample of 101 heart failure patients (37% males) with an average age of 70 years. The final model provided a good fit to the data, supporting the hypothesis that self-efficacy contributes to SM through activation.

Conclusion: The results of this study showed that effective SM interventions should be designed to include strategies to promote both self-efficacy and activation.

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1. Introduction

1.1. Background

Heart failure (HF), a major public health problem worldwide, is one of the most disabling and resource-consuming chronic conditions (Ditewig, Blok, Havers, & van Veenendaal, 2010; Giamouzis, 2011). In the United States, heart failure contributed to significant productivity loss (Bloom et al., 2012), 12–15 million office visits, 6.5 million hospital days and approximately 32 billion U.S. dollars of healthcare expenditure in 2010 (Go et al., 2013). Compared to those from urban areas, heart failure patients discharged from rural hospitals had a higher 30-day readmission rate (Gamble et al., 2011; Kociol et al., 2011; Weeks, Lee, Wallace, West, & Bagian, 2009). Furthermore, rural heart failure patients had a higher risk of 30-day and 1-year death following hospital discharge (Joynt, Harris, Orav, & Jha, 2011; Teng et al., 2014).

Performing HF self-management (SM), such as checking symptoms and weight daily, restricting sodium and fluid, taking medications as

prescribed, exercising regularly and keeping scheduled follow-up appointments, proves to be effective for improving patients' outcomes (Lee, Tkacs, & Riegel, 2009) and reducing readmissions (Giordano, 2009; Jovicic, Holroyd-Leduc, & Straus, 2006). However, evidence indicated that many HF patients failed to routinely perform SM behaviors (Kato, 2009; Macabasco-O'Connell, 2011; Riegel, 2009a). Other than taking medications as prescribed (Macabasco-O'Connell, Crawford, Stotts, Stewart, & Froelicher, 2008; Riegel, 2009a), only 12% of HF patients monitored daily weight (Evangelista, 2008; van der Wal & Jaarsma, 2008); 20% followed a restricted sodium diet (Evangelista, 2008; van der Wal & Jaarsma, 2008); 35–53% exercised regularly (Riegel, 2009a); and 60% kept the scheduled follow-up appointments (Hernandez et al., 2010). Not engaging in the aforementioned SM behaviors is significantly associated with worsening symptoms (van der Wal, 2006), increased readmissions (Riegel, 2009a; van der Wal, 2010) and death (Hernandez et al., 2010; Wu, 2008).

HF self-management is a composite of multiple, complex behaviors that can be affected by various factors. Non-experimental studies showed significant correlations between self-efficacy and SM in HF patients (Bos-Touwen et al., 2015a; Peters-Klimm et al., 2013; Schnell-Hoehn, Naimark, & Tate, 2009; van der Wal, 2010). However, experimental studies failed to demonstrate that increased knowledge and self-efficacy led to increased SM behaviors in HF patients (Clark et al.,

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2009; Evangelista, 2008; Riegel, 2009a). To address the inconsistent evidence, researchers are starting to explore other potential determinants of HF self-management, such as patient activation.

Patient activation, the central concept in Wagner's chronic illness care models (Wagner et al., 2001), is defined by Hibbard as the degree to which the person is ready, willing, and able to engage in health behavior change and manage his/her own health (Lubetkin, Lu, & Gold, 2010). Studies reported higher levels of patient activation contributed to greater engagement of SM behaviors in populations with various chronic conditions (e.g., heart disease (Wolever et al., 2011), hypertension (Cooper et al., 2011), diabetes (Begum, Donald, Ozolins, & Dower, 2011), leading to reduced healthcare uses (Begum et al., 2011; Greene & Hibbard, 2012). The significant relationship between activation and SM were also observed in HF patients (Bos-Touwen et al., 2015b). In addition, several studies reported that interventions aimed to improve SM behavior through enhancing self-efficacy for SM (Lorig, Ritter, Villa, & Armas, 2009; Marks, Allegrante, & Lorig, 2005) also increased activation levels in people with multiple chronic conditions.

1.2. Study aims

In sum, consistent evidence revealed that both activation and self-efficacy play key roles in promoting HF SM behaviors. However, the interrelationship between activation and self-efficacy and their combined effect on SM have not been reported. To address the gap in knowledge, the purpose of this study was to examine the relationships between self-efficacy for SM, patient activation and SM in rural HF patients. It is hypothesized that self-efficacy could affect SM behaviors through the effect of patient activation. To test the hypothesis, the specific aims are to examine:

1. the relationships among self-efficacy for SM, patient activation and HF SM
2. whether patient activation accounts for, or mediates, the relationship between self-efficacy for SM and SM.

2. Methods

2.1. Study design

A correlational study design was used to evaluate relationships among self-efficacy, patient activation and SM in HF patients discharged from rural critical access hospitals. This secondary analysis used the baseline data from a randomized controlled trial titled "Patient Activated Care at Home (PATCH)" which was intended to examine the feasibility and efficacy of a 12-week home-based intervention to improve HF SM adherence (Young, Barnason, & Do, 2014). The study was approved by the University of Nebraska Medical Center Institutional Review Board (IRB PROTOCOL # 228-13-EP) and hospital ethical committees.

2.2. Sample, setting and sample size estimation

Participants were recruited from two rural critical access hospitals in Southeast Nebraska. Patients were eligible for the study if they: 1) were age 21 or older; 2) had HF as one of their discharge diagnoses; 3) had New York Heart Association (NYHA) class II to IV HF or 4) had NYHA class I HF and at least one HF-related hospitalization or emergency department visit in the previous year; 5) were discharged to home; 6) passed a mini-cog screen test (Borson, 2000); 7) understood English; and 8) had access to a phone.

We excluded patients who: 1) had depressive symptoms (received a score of 3 or above on the Patient Health Questionnaire-2 (PHQ-2) (Anonymous, 2008; Li, 2007); 2) were diagnosed with liver cirrhosis; 3) were diagnosed with chronic renal failure; and 4) were diagnosed with their end stage and/or terminal illness (e.g. cancer) which limited the patient's SM capacity. The details regarding sample and setting have

been previously reported (Young et al., 2014). To detect a medium effect correlation ($r = 0.28$) using a two sided test, 5% significance level test ($\alpha = 0.05$) with 80% power ($\beta = 0.2$), the required sample size is approximately 98 ($n = 98$) (Hulley, Cummings, Browner, Grady, & Newman, 2013).

2.3. Measures and instruments

2.3.1. Self-efficacy for HF self-management (SM)

Self-efficacy for HF SM is defined as the confidence or belief in one's ability to manage various aspects of his/her HF and achieve desirable health outcomes (Riegel, 2009b). The Self-Care of HF Index (SCHFI) Sub-scale C (i.e., self-care confidence scale) was used to assess self-efficacy for HF SM, which includes 6 items (questions 17–22) (Riegel, 2009b) on a 4-point Likert scale. Scores are standardized to range from 0 to 100, with higher scores indicating higher self-efficacy. The SCHFI has been widely used to assess the degree of confidence regarding SM in HF patients (Dennison et al., 2010; Dickson, Buck, & Riegel, 2013; Shively et al., 2012). Coefficient alpha on the 6-item self-care confidence scale was 0.827. There was also significant correlation between self-efficacy and SM ($r = 0.42$) (Riegel, 2009b).

2.3.2. Patient activation

Patient activation is defined as "an individual's knowledge, skill, and confidence in managing their health and health care" (Hibbard, Mahoney, Stockard, & Tusler, 2005). Hibbard's Short Form of the Patient Activation Measure (PAM) with 13 items was used to assess patient activation. The short form has similar reliability and validity to the long form (22-item version) across different ages, genders and health condition statuses (Hibbard et al., 2005). Each item of the form was scored on the 5-point Likert response scale. For the ease of interpretation, the raw scores were transformed from the original metric to a 0–100 metric with higher scores indicating higher activation levels. PAM demonstrated high internal consistency (Cronbach alpha = 0.87) and great construct validity as evidenced by significant associations with levels of physical activity, medication adherence, health status, and quality of healthcare (Hibbard, Stockard, Mahoney, & Tusler, 2004; Hibbard et al., 2005; Skolasky et al., 2011). PAM has been tested in various populations living with chronic complex condition (e.g., multiple sclerosis, arthritis, heart disease, diabetes) (Dixon, Hibbard, & Tusler, 2009; Fowles et al., 2009; Hibbard, Collins, Mahoney, & Baker, 2010; Skolasky et al., 2011; Stepleman et al., 2010).

2.3.3. Heart failure self-management (SM)

HF SM is defined as engaging in behaviors that help maintain stability and control symptoms related to HF (Riegel, 2009a, 2009b; Riegel, Carlson, & Glaser, 2000). The 29-item Revised Heart Failure Self-Care Behavior Scale (RHFSB) was used to assess patients' SM behaviors (Artinian, 2002). Each response is granted a score from 0 (none of the time) to 5 (all of the time) (Artinian, 2002). The internal reliability of this questionnaire is consistent with a Cronbach alpha level of .84 (Artinian, 2002).

2.4. Statistical analysis

First, demographic and clinical variables were analyzed using descriptive statistics. Means and standard deviations were used for continuous variables, while frequencies and percentages were used to report categorical variables. Secondly, Pearson's correlation coefficients were used to identify relationships among the variables of interest. Path analysis with maximum likelihood was used to conduct path analysis among self-efficacy, patient activation, and HF SM. Mediation was assessed following the steps outlined by Barron and Kenney (Baron & Kenny, 1986). The normality, linearity and homoscedasticity assumptions were tested and verified prior to conducting the path analysis (Kline, 2005). All data were analyzed using SPSS 20 and M-Plus7.

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