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Original Article

Self-care behaviors in Vietnamese adults with heart failure

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Abstract

Self-care is a cornerstone of therapy for adult patients with heart failure to prevent long-term hospital readmission. This study examines the frequency of self-care behaviors and factors related to such behaviors in Vietnamese adults with heart failure. In this cross-sectional study, random sampling was used to recruit 200 heart failure patients from the outpatient departments in 10 hospitals in northern Vietnam. Study variables were selected according to Orem's theory of self-care. The total mean score for self-care behaviors was moderate, with the lowest mean score being for treatment compliance. Comorbidity, knowledge of heart failure, social support, and barriers to sodium restriction predicted 27.6% of the variance in self-care behaviors. The strongest predictor was barriers to sodium restriction (β=–0.34, p<0.05). The results indicated a need to develop nursing interventions to promote self-care behaviors in this population via modification of the factors identified in this study.

Keywords: self-care behaviors, heart failure, adult

1. Introduction

Cardiovascular disease is among the leading causes of death in Vietnam that killed 36,500 Vietnamese individuals in 2012 (World Health Organization [WHO], 2015). Furthermore, the number of hospitalizations of Vietnamese adults with heart failure (HF) peaked at 50-80% (Kieu & Nguyen, 2011). Notably, the hospitalization rate for adults was found to be higher than the rates for any other age groups. Regarding the long-term outcomes, 10-50% of adult patients with HF were readmitted to the hospital after discharge (Aranda, Johnson, & Conti, 2009). To prevent long-term readmission, adult patients with HF should engage in self-care behavior, which is regarded as a cornerstone of therapy to manage HF. Problematically, patients with HF often do not follow recommendations for self-care (Zaya, Phan, & Schwarz, 2012). Instead of modifying their self-concepts and accepting the fact that they have HF (Artinian, Magnan, Sloan, & Lange, 2002), some patients came to believe that the causes of their illness were out of their control (Goodman, Firouzi, Banya, Lau-Walker, & Cowie, 2013).

Research has identified a range of factors affecting individuals' engagement in self-care (e.g., age, gender, socioeconomic status, education, symptom severity, self-efficacy, depresssive symptoms, and cognitive function) (Oosterom-Calo *et al.*, 2012). Understanding such factors is important to establish effective interventions that complement current awareness of HF management among Vietnamese adult patients with HF; however, most existing studies have examined elderly patients with HF (Klainin & Ounnapiruk, 2010; Nguyen, 2011). Moreover, considering the differences in cultural context regarding health, treatment, and standards of living (Hoang, Dao, Kim, & Byass, 2009; Labun, 2001), existing research in other countries cannot be readily generalized to Vietnamese adults with HF. Therefore, this study describes self-care behaviors and examines the relationship between self-care and predictive factors in adults with HF using Orem's theory of self-care.

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1.1 Conceptual framework

We used Orem's theory of self-care and a literature review to drive our selection of the predictive factors of self-care in patients with HF. Orem's theory proposes the existence of universal, developmental, and health deviation self-care requisites. Health deviation self-care requisites are associated with disease and medical care. They describe or are performed on ill persons and as such can be considered the contents of self-care. To meet these health deviation self-care requisites, the self-care agent must carry out specific care measures (Orem, Taylor, & Renpenning, 2001). According to Orem's theory, self-care behavior for patients with HF could be defined as practicing various daily living activities in relation to their disease, such as taking a prescribed medication, following dietary and fluid restrictions, engaging in exercise, weighing oneself daily, monitoring and recognizing early symptoms, seeking appropriate medical assistance, and modifying their self-concept (Artinian *et al.,* 2002).

Adult patients must engage in self-care behaviors and manage the various influencing factors in order to regulate their functioning and meet their self-care requisites. If they do not, they will experience a self-care deficit (Orem *et al.,* 2001). The basic conditioning factors of self-care originate both internally and externally and can affect the individual's ability to engage in self-care, the amount of self-care required, or the specific self-care actions needed. These factors include age, gender, developmental state, health state, socio-cultural orientation, health care system factors, family system factors, pattern of living, environment factors, and resource availability and adequacy.

In this study, based on Orem's theory of self-care, the theoretical background, and supporting evidence from empirical research on self-care among adults with HF, we examined the following predictors of self-care in patients with HF: gender, knowledge, symptom severity, comorbidity, education, social support, and barriers to sodium restriction (Oosterom-Calo *et al.,* 2012).

2. Materials and Methods

2.1 Study design

A descriptive, cross-sectional, predictive correlational design was used. All data were collected from outpatients with HF. We hypothesized that gender, knowledge, symptom severity, comorbidity, education, social support, and barriers to sodium restriction would predict self-care among adults with HF.

2.2 Setting and sample

Multistage sampling was used to obtain a probability sample of Vietnamese adult heart failure patients from 10 cities and provinces in the Red River Delta (in northern Vietnam) between July and October 2015. After obtaining permission from each hospital, physicians confirmed the diagnosis of 200 HF patients who had been discharged in the previous six months, had visited outpatient departments in government and provincial hospitals, were aged 18-60 years, and were able to read, write, and speak Vietnamese. All of these patients were then recruited by the author for participation. Patients were not invited to participate if they had experienced a significant worsening of their disease (based on medical records). The sample size was estimated using a desired ratio of 15 to 20 respondents per variable (Hair, Black, Babin, & Anderson, 2010). Thus, a sample size of 140 might be adequate for the 7 variables included in the current study. However, Hair *et al.* also recommend a standard sample size of 200, so we recruited at least that many to participate in this study.

Before the main study took place, a pilot study using a convenience sample was conducted to examine the psychometric properties of the study instruments. The sample size for this pilot study was defined using a minimum participant-to-item ratio of 5:1 for the instrument with the most items (the Revised Heart Failure Self-Care Behavior Scale [RHFScBS] see DeVellis, 2012). Therefore, 145 outpatients were recruited.

2.3 Ethical considerations

This study received ethical approval (decision No. 265/2015/YTCC-HD3) from the Institutional Review Board (IRB) of the Hanoi School of Public Health, Vietnam. All participants submitted their informed consent after obtaining a full explanation of the study from researchers. The informed consent process ensured that the patients understood the confidential nature of the study and that they could withdraw from the study at any time.

2.4 Measurements

Seven nursing professors and cardiology experts reviewed the validity of all questionnaires used in this study for psychometric testing. Following the suggestions of these experts and the instrument developers, some of the RHFScBS items were modified to better fit the Vietnamese cultural context. In addition, after translation, the construct validity for the instruments, including those that measure self-care, social support, and barriers to sodium restriction, was tested using confirmatory factor analysis (CFA).

Self-care was measured using the RHFScBS (Artinian *et al.,* 2002). This instrument contained 29 items and the responses were provided on a 6-point scale addressing five of the six health deviation self-care requisites in Orem's self-care model. The maximum possible score was 145 which indicated that all self-care behaviors were always performed. In this study, the internal consistency reliability of the RHFScBS was acceptable (Cronbach's α=89). The CFA grouped the 29 items into 5 factors, thus supporting this instrument's construct validity.

Knowledge of HF was measured using the Dutch Heart Failure Knowledge Scale (DHFKS) which is a 15-item instrument with a possible score range of 0-15. The scale measures general HF knowledge and HF treatment knowledge (van der Wal, Jaarsma, Moser, & van Veldhuisen, 2005). In this study, a Kuder–Richardson formula 20 (KR20) and the Test Analysis Program (TAP) were used to confirm the instrument's reliability and construct validity. The KR20 yielded a value of 0.69 which indicated satisfactory reliability. The TAP revealed average difficulty indexes (0.25-0.68) and good discrimination indexes (above 0.3) for most items.

Comorbidity was examined using the Charlson Comorbidity Index (Katz, Chang, Sangha, Fossel, & Bates,

1996), which classifies comorbidity according to the number and severity of the comorbid diseases. Most diseases are assigned an index of 1, while more severe conditions are given a weighted score of 2, 3, or 6. The total score on the Charlson Comorbidity Index is the sum of the weighted scores and ranges from 0 to 34. Higher scores indicate greater burden and severity of comorbid conditions.

Social support was measured using seven items from a social support questionnaire. All items were rated on a 5-point Likert scale (0=not at all, 4=a great deal; Hanucharumkul, 1989). This instrument is divided into three subscales, informational support, emotional support, and tangible support. Data were collected at two points. At first the participants answered the items in terms of support from family members and friends. Subsequently, they completed the same questionnaire in terms of support from health care providers. The total score was defined as the sum of these two scores. This instrument's internal consistency reliability was acceptable (Cronbach's α=0.86 and 0.83 for family/friends and health care providers, respectively).

Barriers to sodium restriction were measured using the "barriers" subscale of the Beliefs about Dietary Compliance Scale (Bennett, Milgrom, Champion, & Huster, 1997). This subscale is comprised of 5 items and responses were made on a 5-point Likert scale (1="strongly disagree" to 5="strongly agree"). Possible scores ranged from 5 to 25, where higher scores indicated greater barriers to sodium restriction. This instrument's internal consistency reliability was acceptable (Cronbach's α=0.81).

2.5 Data collection

Following IRB approval, the researcher visited the nursing headquarters in each hospital and explained the contents, aims, and expected outcomes of the study. The researcher recruited one nurse as a research assistant from each hospital. Each nurse was then educated on the content of the questionnaires and methods of accurate data collection. The research assistant in each hospital obtained the list of patients discharged in the previous six months who had attended follow-up appointments with their physicians. The eligible participants were then randomly selected by the researcher and were invited to participate as they were waiting in the outpatient department. After obtaining the consent forms from the patients, we gave them the study questionnaires. On average, it took approximately 30 min for each patient to complete all instruments.

2.6 Data analysis

As noted above, TAP was used to analyze the item difficulty and discrimination in the DHFKS. LISREL version 8.72 was used to conduct the CFAs for the instruments. SPSS Statistics 17 was used for all remaining data analyses. An alpha value of 0.05 was set as the acceptable level of significance for this study. The relationships between the predictor variables and self-care were examined using multiple regression analysis. The assumptions of linearity, homoscedascity, and absent multicollinearity for the regression analysis were met.

3. Results

In this study, 200 adult HF patients who visited outpatient departments in 10 hospitals in northern Vietnam were analyzed. The mean age of participants was 53.46±6.71 years, and 51.5% were female. Approximately 25% of the patients were early retirees. The duration of living with a diagnosis of HF varied from 1 to 22 years, with a mean duration of 4.8±3.9 years. The range of time since discharge was 1-6 months, which was in line with the study purpose, and the mean was 3.4±2.1 months. Almost 86% participants had a score of 2-6 on the Charlson Comorbidity Index, which meant they had between 2 and 4 comorbid diseases in addition to their HF. The other background characteristics of the patients with HF are presented in Table 1.

The total scores for self-care behavior ranged from 31 to 136 with a mean of 82.23±21.69. The mean scores for all 5 domains were considered moderate as well as the total mean score (Table 2). For the item scores, the lowest mean score was 0.97, and the highest was 4.25.

Table 1. Participant demographics (n=200).

Sample characteristics	Frequency	Percentage
Age (Range=20-60, $\bar{X}$=53.46, SD=6.71)		
20-39	10	5.0
40-60	190	95.0
Gender		
Male	97	48.5
Female	103	51.5
Marital status		
Married	175	87.5
Divorced or separated	8	4.0
Single	5	2.5
Widowed	12	6.0
Education		
Primary school	69	34.5
Secondary school	61	30.5
High school	56	28.0
Undergraduate or graduate degree	14	7.0
Employment		
Homemaker	29	14.5
Employed part time	55	27.5
Employed fulltime	50	25.0
Unemployed	16	8.0
Other	50	25.0
Living		
Living alone	7	3.5
Married/living with other	78	39.0
Living with other family member	115	57.5
NYHA		
Class I	4	2.0
Class II	101	50.5
Class III	88	44.0
Class IV	7	3.5
Elapsed time since HF diagnosis		
1-5 year(s)	132	66.0
6-10 years	54	27.0
>10 years	14	7.0

NYHA: *New York Heart Association*

Table 3 shows the bivariate correlation coefficients between potential predictors and self-care scores. All variables were significantly associated with self-care except for symptom severity, gender, and education level. The results of the multiple regression analysis are shown in Table 4. The results of this analysis showed that higher barriers to sodium restriction and social support and fewer comorbid diseases predicted 27.6% of the variance in self-care (R^2=0.276, F(4, 195) = 18.59, p=0.000).

Table 2. Descriptive statistics of 5 domains of self-care behaviors in HF.

Domain (number of items)	Range	Mean	Median	SD	Interpretation
Seeking assistance (6)	1-29	16.92	17	5.550	Moderate
Being aware of effects and results of HF (5)	3-25	15.78	16	4.333	Moderate
Treatment compliance (12)	9-59	32.18	30	9.643	Moderate
Modifying self- concept (2)	0-10	5.93	6	2.676	Moderate
Learning to live (4)	1-20	11.27	11	4.094	Moderate
Total (29)	31-136	82.23	82.50	21.69	Moderate

Table 3. Intercorrelations between variables.

	1	2	3	4	5	6	7	8	9	10
1. Knowledge	1									
2. Social support	.214*	1								
3. Comorbidity	-.029	-.124*	1							
4. Gender	-.031	-.162*	.005	1						
5. Symptom severity class 2	.000	-.078	-.051	-.021	1					
6. Symptom severity class 3	-.005	.103	.097	.016	-.895	1				
7. Symptom severity class 4	.007	-.027	-.018	-.037	-.192*	-.169*	1			
8. Barrier of sodium restriction	.005	-.096	.083	.081	.050	-.051	.013	1		
9. Education	.110	.043	.182*	-.037	.035	-.101	.145*	.132*	1	
10. Self-care behaviors	.198*	.312*	-.256*	.040	-.023	.034	-.015	-.375*	-.087	1

*p<0.05

Table 4. Multiple regression analysis results (n=200).

Predictors	*b*	*SE(b)*	*β*	*t*	P-value
Barrier of sodium restriction	-1.81	.33	-.34	-5.50	.000
Social support	.545	.15	.23	3.56	.000
Comorbidity	-2.12	.67	-.19	-3.19	.002
Knowledge	1.09	.46	.15	2.35	.020
Gender			.11	1.82	.070
Education			-.04	-.55	.580
Symptom severity class 2			.002	.03	.977
Symptom severity class 3			.01	.22	.828
Symptom severity class 4			-.009	-.14	.887
Intercept=85.29, R^2=.276, $F_{4,195}$=18.59, p=0.000					

4. Discussion

The mean self-care score in this study was lower than Caucasian Americans with HF (85.49±17.31), but higher than Korean Americans with HF (79.53±16.42) (Jang, Toth, & Yoo, 2012). When examining the mean score of each item, we found that the lowest mean score was for item 23 ("I get a flu shot once a year"). This might indicate that the influenza vaccination is still not common in this population in Vietnam, even though the Ministry of Health in 2011 recommended that patients with HF have annual flu shots.

The mean score for treatment compliance was the lowest among the 5 subscales of the self-care instrument (2.68). Among the items in this subscale, medication adherence was the most frequent self-care behavior. This was also found in Artinian *et al.* (2002). Thus, it seems that regardless of their country of residence or ethnicity, patients with HF tend to adhere to their medications. The less frequently performed behaviors were related to obtaining a flu shot, alcohol intake, weight management, and fluid restrictions, which was consistent with the findings of Artinian *et al.* (2002), Kato *et al.* (2009), and Barber, Currie, and Gar-

diner (2011). Again, the fact that these findings were consistent across these studies suggests that these behaviors might be common to patients with HF across different countries and cultural backgrounds.

The low mean scores for treatment compliance, seeking assistance, and learning to live with the disease might underlie the repeated hospitalizations commonly observed in patients with HF. The results of this study might reflect the real situation in Vietnam with patients focusing solely on medication adherence and being less likely to seek help for worsening symptoms, contacting health care providers or sharing their health conditions with family members. Patients might instead delay contacting their health care provider and find another solution, such as following the directions of a medication previously prescribed to them. Similarity, greater feelings of guilt and uselessness may derive from the perception of being a burden on others and they are more likely to become isolated from their family and friends (Jeon, Kraus, Jowsey, & Glasgow, 2010). Such poor self-care behaviors may then lead to readmission to the hospital.

Among the significant predictors found in this study, barriers to sodium restriction had the strongest correlation with self-care behaviors (β=–0.338, p<0.05). This result was consistent with a systematic review of the determinants of HF self-care behaviors which reported that the perceived barriers to restriction were negatively correlated with actual restriction on sodium intake (Oosterom-Calo *et al.,* 2012). This result is also consistent with the definition of basic conditioning factors in their pattern of living. Pattern of living refers to those repetitively performed daily activities, including the self-care measures that must be performed on a daily basis, and the responsibilities that a patient may have in relation to others that could limit their health deviation self-care requisites (Orem *et al.,* 2001). Among the patients with HF, one health deviation self-care requisite that must be met is low sodium intake through a low sodium diet. However, the patient might also engage in a high sodium diet if his or her family members have a high sodium diet. Furthermore, social services do not often cater to a low sodium diet. These individuals may be unable to effectively engage in sodium restriction (Chung *et al.,* 2006; Nguyen *et al.,* 2012).

Sodium restriction is also seen as one of the most effort-intensive self-care requirements, particularly among adults. However, many cost-effective interventions to reduce sodium intake have been conducted with people at high risk of cardiovascular disease (Nguyen *et al.,* 2012), which may mean that individuals can find ways of effectively overcoming the barriers to reduce their sodium intake. In addition, women appear to be better at following a low salt diet than men (Chung *et al.,* 2006) perhaps because they more commonly prepare their own meals and can better persuade other family members to follow their low salt diet. Furthermore, from a cultural perspective, many Vietnamese mothers abstain from eating out in restaurants in order to save money and therefore avoid high sodium food.

Comorbidity was found to be significantly and negatively correlated with self-care (β=–0.18, p<0.05). Adults with HF tend to be less likely to engage in health-maintenance self-care practices when they have two or more comorbid conditions (Bayliss, John, Douglas, Lori, & Deborah, 2003). Furthermore, in a past study, around 39% of the remote Vietnamese population reported having at least one chronic disease along with cardiovascular disease (Hoang, Dao, & Kim, 2008). Having a comorbid disease can cause patients with HF to struggle with distinguishing their HF symptoms from those of their other diseases which require them to follow various dietary requirements and remember to take multiple medications (Riegel *et al.,* 2009). It may also be more challenging for patients with HF who have comorbidities to comply with their treatment and they might continually delay seeking out health care services.

Knowledge was significantly positively correlated with self-care (β=0.14, p<0.05). Patients were more likely to carry out effective self-care when they understood its importance and the reasons for the requirements self-care placed on them (Vaughan Dickson, Lee, & Riegel, 2011). In this study, the mean knowledge score of the participants remained somewhat low (7.7±2.94). Therefore, in order to motivate HF patients to undertake effective self-care, nurses should understand the knowledge level of the patients and the positive effect of linking self-care requirements to understanding the importance of self-care.

Social support was significantly positively correlated with self-care (β=0.25, p<0.001). Through managing the progressive nature of HF and its physical symptoms, patients experience challenges and are burdened by the requirements of self-care. Support from family, friends, and health care providers can help patients monitor their symptoms and carry out healthy behaviors, effectively promoting self-care maintenance and assisting with their daily activities (Graven & Grant, 2014). Vietnamese people, especially the remote, low-income population, may require additional support due to food insufficiencies and extra medical care costs due to chronic illness (Hoang *et al.,* 2009). Importantly, the cooperation of family and health care providers in understanding and supporting the patients who experience emotional hardships due to their HF is likely to have a beneficial effect on self-care management.

In this study, education was not correlated with self-care scores. Patients with greater education may be more likely to already recognize and understand the symptoms of HF and other chronic diseases, thus facilitating adherence to self-care requirements. By contrast, patients with less education may be readily able to acquire such knowledge, particularly as self-care involves education (Orem *et al.,* 2001). In one study, knowledge scores regarding HF-related self-care in an intervention group were higher than were those in a control group, independent of education level (Barnason, Zimmerman, & Young, 2011).

This study had the following limitations. First, although data were collected from 10 cities and provinces in the Red River Delta under a variety of circumstances and from several self-care groups, the sample was relatively small and only outpatients were examined. Second, self-care might have been over-reported, as the instruments used a self-report format and reporting effective self-care is desirable. Finally, this study's cross-sectional design prevented any inferences from the causal relationships between the examined factors.

5. Conclusions

This study examined the factors that predict self-care in patients with HF according to Orem's self-care theory. The strongest positive predicting factor was barriers to sodium

restriction. Patients who were knowledgeable of HF symptoms and HF self-care requirements received more social support, had fewer comorbid diseases, and had a greater likelihood of carrying out self-care behaviors more frequently. Interventions improving self-care knowledge should aim to explain why self-care is important and how to carry it out effectively. Additionally, interventions addressing the support of family members might effectively promote self-care among adults with HF, particularly among people with comorbid diseases living in rural or remote areas.

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