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RESEARCH ARTICLE



Self-care Activation, Social Support, and Self-care Behaviors among Women Living with Heart Failure

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ABSTRACT

Background: Three million U.S. women live with heart failure (HF). **Purpose:** This study investigated relationships among self-care activation, social support, and self-care behaviors of women living with HF. **Methods:** A 52-item web-based survey was completed by 246 women living with HF. **Results:** Women reported a mean body mass index (BMI) of 30.8 ± 7.8 kg/m², exercising a mean 106.5 ± 141.1 min/week, and consuming 3.25 ± 1.9 mean servings fruit/vegetables each day. Significant predictors of weekly physical activity minutes included self-care activation, activities of daily living (ADLs) total score, and current tobacco use. Low self-care activation, poor self-perceived health, greater ADL limitations, and more years living with HF were statistically significantly associated with having a higher BMI. Self-perceived health status and education and income levels were significant predictors of daily fruit/vegetable servings. **Discussion:** Although self-care activation was positively associated with health behaviors among women living with HF, self-care management of health behaviors remained suboptimal. Evaluating self-perceived health status of women with HF may identify appropriate interventions for improving self-care behaviors. **Translation to Health Education Practice:** Certified Health Education Specialists are encouraged to tailor their education to raising self-care activation, improving self-perceived health, underscoring the value of tangible physical activities (climbing stairs, walking, carrying groceries), and referring women with HF to cardiac rehabilitation.

ARTICLE HISTORY

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Background

Given an aging population and improved survival, the prevalence of heart failure (HF) has significantly increased worldwide, especially in individuals older than 65 years.¹ Currently, 5.7 million Americans are living with HF, with the prevalence expected to reach over 8 million by 2030.² Three million American women live with HF and in 2011 more women than men died of HF.² By age 40, the lifetime risk of HF is 1 in 9 for men and 1 in 6 for women. Although HF survival has improved, 50% of individuals with HF will die within 5 years.² There are approximately 1 million hospital discharges for HF and 1.8 million annual physician office visits with a primary HF diagnosis. Adherence to symptom monitoring can decrease preventable hospitalizations.³ In fact, about half of HF rehospitalizations are preventable and result from inadequate discharge teaching, nonadherence to health behaviors, or failure to follow up with a primary care provider or HF-specific program.⁴

Self-care is the active cognitive process an individual employs to maintain health or manage illness.^{5,6} Self-care activation by individuals with HF is the ability to take independent actions to manage HF, which involves

having the knowledge, confidence, and skills necessary to self-manage HF, collaborate with providers, maintain functioning, and access appropriate care. In short, self-care activation describes an individual's willingness and capacity to participate in decisions about his or her own care. Key to recovery, self-care activation includes 3 interrelated components: self-care maintenance, self-care management, and self-care confidence.⁷

Individuals with HF present a multifaceted care management challenge. As such, activating effective self-care for managing HF is critical for an improved quality of life and a favorable prognosis. Self-monitoring, compliance with diet and physical activity, and symptom recognition are essential components of HF self-care activation. Proficiency in HF self-care requires adequate health literacy, a range of daily skills across multiple domains, and effective cognitive functioning.⁸⁻¹⁰

Individuals with HF and with cognitive impairment may struggle with tasks such as organizing and taking medications.¹¹ Studies to improve active self-care of individuals with HF through telephone calls and group-based education have generally failed to reduce

death or HF hospitalizations.^{12,13} Though techniques such as automated device-based and mobile monitoring effectively reduce mortality risk, decrease HF-related hospitalizations,¹⁴ and improve HF self-care,¹⁵ one third of individuals refuse home telehealth due to technology anxiety and preference for in-person care.¹⁶

Education for activating and optimizing HF self-care is recommended in all HF guidelines.¹⁷⁻¹⁹ To thrive with HF, individuals must be informed about their illness, actively engage in their own care, and be proficient in self-management skills. Activating and improving self-care skills also requires self-efficacy and social support to empower individuals with HF to manage their illness. Education that is not tailored to the individual's own situation may be insufficient to improve survival or reduce hospitalizations.²⁰

Purpose

The purpose of this study was to examine the issues facing women with HF and to explore the relationships among self-care activation, social support, self-perceived health status, activities of daily living, and health behaviors (physical activity, weight management, and fruit and vegetable consumption) among women living with HF. WomenHeart: The National Coalition for Women with Heart Disease (“WomenHeart”), an organization dedicated to providing education, advocacy, and support to women with heart disease, will translate this study's findings into sex-specific education resources for dissemination to its members, National Hospital Alliance members, Certified Health Education Specialists, and support group participants. WomenHeart will also apply these findings to policy recommendations at the federal level.

Methods

Study design

Data for this cross-sectional study were gathered via a web-based survey from a sample of women living with HF. An independent institutional review board, Ethical and Independent Review Services (Independence, Missouri), reviewed and approved all aspects of the study.

Procedures

In consultation with the first author of this article, who is a member of WomenHeart's Scientific Advisory Council (a group composed of 15 cardiologists and heart disease researchers who provide WomenHeart with medical and scientific leadership and guidance), we developed a draft version of the

survey ready for pretesting, keeping in mind the need to be brief and relevant both to reduce respondent burden and to sustain respondents' interest in completing the survey. Twelve women with HF, who responded to an e-mail invitation sent from WomenHeart to members of its database, pretested the survey. For the pretest, we asked these 12 women to record the number of minutes it took them to take the survey; any content they found confusing, offensive, inaccurate, or missing; and what they found pleasantly surprising about the survey. Based on the pretest findings, we made minor modifications to the survey, such as simplifying language in the informed consent preamble.

WomenHeart maintains a database of approximately 35 000 members registered through its website (<http://www.womenheart.org/>), of whom approximately 16 254 identify as a woman with heart disease (unfortunately, we do not know the proportion of women specifically with HF condition from this number). Women were recruited to this study through WomenHeart's database, monthly e-newsletter, Facebook page, Twitter account, LinkedIn profile, and online community. Participants had to be a woman at least 18 years of age, have HF diagnosed by a physician, have Internet access, and be able to read and comprehend English. Participants voluntarily agreed to take part in the study. Data were confidential and accessible only to study personnel. No personal identifiers were obtained from survey respondents and all responses were aggregated for data analysis. Respondents received no compensation for participation.

Measures

The online survey included 52 closed-ended questions using Qualtrics (Provo, UT). The first 5 questions offered voluntary participation and determined eligibility. The remaining questions sought demographic characteristics, HF symptoms, comorbidities, medications, self-perceived health status, and health behaviors including smoking, weight management reflected as body mass index (BMI), fruit and vegetable consumption, medication adherence, and physical activity. Composite scales examined the concepts of self-care activation, social support, and activities of daily living. The composite scales were developed using subsets of the survey's 52 questions.

Self-care activation composite score

To reduce respondent burden and make the survey relevant to HF, we used 11 of the 22 items in the Patient Activation Measure and changed “health condition” to “heart failure condition” (Table 1)²¹ to create our self-care activation composite score. Higher scores

Table 1. Items comprising the self-care activation composite score.^a

-
- When all is said and done, I am the person who is responsible for managing my heart failure condition.
 - Taking an active role in my own health care is the most important factor in determining my health and ability to function.
- Confidence and knowledge to take action (6/10 of the original items):
- I am confident that I can take actions that will help prevent or minimize some symptoms or problems associated with my heart failure condition.
 - I know what each of my prescribed medications does.
 - I am confident that I can tell when I need to go get medical care and when I can handle a health problem myself.
 - I am confident that I can tell a doctor concerns I have even when he or she does not ask.
 - I understand the nature and causes of my heart failure condition.
 - I know the different medical treatment options available for my heart failure condition.
- Taking action (2/6 of the original items):
- I have been able to maintain the lifestyle changes that I have made for my heart failure condition.
 - I know how to prevent further problems with my heart failure condition when new situations or problems arise.
- Staying the course under stress (1/4 of the original items):
- I am confident that I can maintain lifestyle changes, like diet and exercise, even during times of stress.
-

^aAdapted from the Patient Activation Measure. Using a Likert-type scale, the responses ranged from 1 = *strongly disagree* to 5 = *strongly agree*.

indicated better self-care activation. Cronbach's alpha (α) was .87. The total score ranged from a possible 11 to 55.

Activities of daily living composite score

To reduce respondent burden, we adapted the SF-36 Health Survey (Medical Outcomes Study 36-Item Short Form)²² by including 3 of the 10 items related to how limited respondents were climbing several flights of stairs, walking several blocks, and lifting or carrying groceries (Table 2). These 3 activities can help to reveal how well women with HF are managing independently. Higher scores reflected better activities of daily living (ADLs). Cronbach's α for the scale was .80.

Self-perceived health status

We used one verbatim SF-36 Health Survey item to ascertain respondents' self-perceived health status (Table 2). This SF-36 single item question has ample evidence in the literature of validity with numerous and diverse populations.²³⁻³¹

Social support composite score

We used 6 of the 7 verbatim items from the ENRICH Social Support instrument to assess emotional, instrumental, informational, and appraisal attributes of social support (Table 3).³²⁻³⁴ Cronbach's α was .90. The total score could range from a possible 6 to 24.

To identify additional variables that would affect the lives of women with HF, we added measures of bodily

Table 2. Survey metrics

Heart failure symptoms, <i>n</i> (%)
Which of the following symptoms do you experience as a result of your HF condition?
Shortness of breath/difficulty breathing during daily activities, 183 (75)
Generally feeling weak or tired, 183 (75)
Difficulty engaging in physical activity, 138 (56)
Swelling around the ankles, feet, legs, and/or abdomen, 133 (54)
Weight gain, 123 (50)
Rapid heart rate, 96 (39)
Shortness of breath/difficulty breathing when lying down, 81 (33)
Sleep disturbances, 82 (33)
Persistent cough, 56 (23)
Self-perceived health status, <i>m</i> (SD), 2.67 (0.99)
In general, would you say your health is ..., <i>n</i> (%)
Poor, 27 (11)
Fair, 82 (33.3)
Good, 88 (35.8)
Very good, 35 (14.2)
Excellent, 10 (4.1)
Bodily pain, <i>m</i> (SD), ^a 3.24 (1.25)
How much bodily pain have you had during the past 4 weeks? ^b
None, very mild, mild, moderate, severe, very severe
Activities of daily living composite score, <i>m</i> (SD), ^a 5.78 (1.98)
The following questions are about activities you might do during a typical day. Does your health now limit you in this activity? If so, how much?
Climbing several flights of stairs, <i>m</i> (SD), 2.03 (0.728)
Limited a lot, 120 (49)
Limited a little, 87 (35.7)
Not limited at all, 37 (15.2)
Walking several blocks, <i>m</i> (SD), 2.00 (0.776)
Limited a lot, 72 (29.8)
Limited a little, 97 (40)
Not limited at all, 73 (30.2)
Lifting or carrying groceries, <i>m</i> (SD), 2.00 (0.78)
Limited a lot, 59 (24.4)
Limited a little, 117 (48)
Not limited at all, 66 (27.3)
Daily activity interference—Emotional, <i>m</i> (SD), ^a 2.72 (1.2)
During the past 4 weeks, to what extent have you accomplished less than you would like in your work or other daily activities as a result of any emotional problems (such as feeling depressed or anxious)?
None at all, a little bit, some, quite a bit, could not do daily work
Daily activity interference—Physical, <i>m</i> (SD), ^a 2.72 (1.2)
During the past 4 weeks, how much difficulty did you have doing your work or other regular daily activities as a result of your physical health?
None at all, a little bit, some, quite a bit, could not do daily work

^aFrom the SF-36 Health Survey (Medical Outcomes Study 36-Item Form).

^bThe original survey item used the "during the past week" time frame.

Table 3. Items comprising the social support composite score.^a

-
- Is there someone available to you whom you can count on to listen to you when you need to talk?
 - Is there someone available to you to give you good advice about a problem?
 - Is there someone available to you who shows you love and affection?
 - Is there someone available to help you with daily chores?
 - Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)?
 - Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?
-

^aAdapted from the ENRICH Social Support instrument. To reduce respondent burden, our study's scale included 4 of the 5 ENRICH instrument response options: *none of the time* (1), *a little of the time* (2), *most of the time* (3), and *all of the time* (4) (the ENRICH scale also includes *some of the time*). We obtained information on the seventh ENRICH item, "Are you currently married or living with a partner? Yes/No" from another question in our survey, "What is your marital status? Single, never married; now married; living with partner; separated; divorced; widowed."

pain and emotional and physical interference to the survey. These items can help to reveal how well a woman with HF is able to be physically active and cope emotionally.

Bodily pain

We adapted the SF-36 Health Survey item to ascertain respondents' self-perceived level of bodily pain (Table 2).

Daily activity interference—Emotional

We adapted the SF-36 Health Survey item to ascertain respondents' interference with daily activity due to emotional problems (Table 2).

Daily activity interference—Physical

We adapted the SF-36 Health Survey item to ascertain respondents' interference with daily activity due to physical problems (Table 2).

We also created our own measures to collect respondents' symptoms (Table 2), comorbidities (Table 4), and level of medication adherence (Table 6).

Data analysis

Data obtained from the Qualtrics survey software were exported to Excel. Univariate and bivariate distributions were examined using frequencies and cross-tabulation procedures to check for outliers and assess univariate normality. Descriptive statistics including means, standard deviations, correlations, and percentages

Table 4. Risk factors, comorbidities, medications ($N = 246$).

Risk factors	n (%)
Hypertension	132 (55)
Dyslipidemia	111 (46)
Tobacco use	
Never	124 (51)
Former	115 (47)
Current	6 (2)
Body mass index, kg/m^2 , m (SD)	30.8 (7.8)
Years living with heart failure, 0–44 years, m (SD)	7.6 (8)
Comorbidities, n (%)	
Previous myocardial infarction	97 (40)
Coronary artery disease	95 (39)
Cardiomyopathy	90 (37)
Depression	84 (35)
Arthritis	65 (27)
Anxiety	62 (26)
Diabetes	59 (24)
Cardiac arrhythmia	58 (24)
Valvular heart disease	40 (17)
Medications, n (%)	
Beta blocker	169 (69)
Diuretic	145 (59)
Cholesterol-lowering drug	130 (53)
Angiotensin-converting enzyme inhibitor	74 (30)
Angiotensin II receptor blocker (or inhibitor)	53 (22)
Antiplatelet agent	49 (20)
Calcium channel blocker	34 (14)
Vasodilator	34 (14)
Digitalis preparation	33 (13)
Anticoagulant	24 (10)
Novel oral anticoagulant	12 (5)

summarized the study variables. To examine the relationships among self-care activation, social support, self-perceived health status, and self-care behaviors, the bivariate correlations between the self-care behaviors (physical activity minutes per week, BMI, and fruit and vegetable consumption) and theoretically plausible variables were explored. Variables with a correlation coefficient greater than 0.10 in the bivariate analyses were included in multiple regression analyses to determine the important correlates of physical activity, BMI, and fruit and vegetable consumption. The dependent variables included the behaviors of physical activity, BMI, and fruit and vegetable consumption. The independent variables were self-care activation, social support, and self-perceived health status. We did not run multiple models to avoid inflating the error rate.

All tests were 2-tailed and evaluated for statistical significance using an α criterion of .05. Statistical analyses were performed using SPSS Version 22 for Windows (IBM Corp.; Armonk, NY).

Results

Respondents

A total of 603 individuals clicked on the survey URL, and 471 agreed to participate in the study. Of these, 96 individuals were excluded for lacking a diagnosis of HF, 1 male was excluded, and 128 did not complete the entire survey. The final sample size was 246 respondents. Demographic characteristics of the sample are presented in Table 5. With a mean age of 59.2 ± 11 years (range 25–89), most women were white, married/partnered, with education attained at least at an associate degree or higher (60%). Most women (60%) had an annual total household income of \$40 000 or more. Respondents reported multiple risk factors including hypertension (55%), dyslipidemia (46%), and cigarette smoking (47% former; 2% current). With a BMI of $30.8 \pm 7.8 \text{ kg}/\text{m}^2$, most women were overweight (Table 4). About one third of women had comorbidities including previous myocardial infarction (40%), coronary heart disease (39%), depression (35%), anxiety (26%), and diabetes mellitus (24%). Most women reported taking numerous medications, including beta blockers (69%), diuretics (59%), lipid-lowering agents (53%), and angiotensin-converting enzyme inhibitors (30%). About 30% of women had an implantable cardioverter defibrillator and had been living with HF for a mean of 7.6 ± 8 years.

The 3 most frequently reported HF symptoms were shortness of breath during daily activities (75%), generally feeling weak or tired (75%), and difficulty engaging in physical activity (56%; Table 2). Most women

Table 5. Demographic characteristics ($N = 246$).

Demographic characteristic	n (%)
Age, m (SD)	59.2 ± 11
Marital status	
Single never married	24 (10)
Married/partnered	135 (55)
Separated/divorced	55 (22)
Widowed	22 (9)
Ethnicity ($n = 246$)	
Non-Hispanic	242 (98)
Race ^a	
White	206 (85)
Black	31 (13)
Asian	3 (1)
American Indian	6 (2)
Pacific Islander	2 (1)
Education	
Less than high school	7 (3)
High school	24 (10)
Some college	68 (28)
Associate degree	28 (11)
Bachelor's degree	61 (25)
Graduate/professional degree	58 (24)
Employment status	
Full-time	65 (27)
Part-time	23 (10)
Unemployed	14 (5)
Homemaker/student	15 (6)
Retired	76 (32)
Disabled/medical leave	48 (20)
Household income (\$)	
<40 000	77 (40.3)
40 000–89 999	73 (38.2)
90 000–149 999	27 (14.1)
150 000+	14 (7.3)

^aRespondent could check more than one.

rated their overall health as good (36%) or fair (33%), with fewer rating their health as poor (11%), very good (14%), or excellent (4%). More women were limited a lot in climbing several flights of stairs (49%) compared to walking several blocks (30%) or lifting groceries (24%). They reported that their physical health status created more difficulty in accomplishing daily activities than their emotional health status. Self-perceived health status (poor, fair, good, very good, excellent; Table 2) was significantly positively associated with the ability to climb stairs ($r = 0.475$), walk several blocks ($r = 0.577$), and carry groceries ($r = 0.422$), and negatively associated with limitations due to physical health ($r = -0.564$), emotional health problems ($r = -0.418$), and bodily pain ($r = -0.411$; $P < .05$ for all; data not shown in the table).

Self-care activation, social support, and self-care behaviors

The mean self-care activation score, social support score, and self-reported self-care behaviors are presented in Table 6. The mean self-care activation score was 44.3 ± 7.7 and the mean social support score was 17.2 ± 4.8. Women reported a mean of 106.5 ± 141.1 min of moderate-intensity physical activity per week. The self-reported mean weight of the sample was 183 ± 49

Table 6. Self-care activation, social support, and self-care behaviors ($N = 246$).

Variable	Mean (SD)
Self-care activation score	44.3 (7.7)
Social support score	17.2 (4.8)
Self-care behaviors	
Minutes of moderate physical activity/week	106.5 (141.11)
0–49 min, n (%)	208 (85)
50+ min, n (%)	38 (15)
Weight (lb.)	183 (48.7)
Servings of fruit and vegetable per day (0–7)	3.25 (1.9)
Attended part of cardiac rehabilitation, n (%)	37 (15%)
Completed cardiac rehabilitation program, n (%)	91 (37%)
Participated in support group, n (%)	53 (22)
Adherence to medications ($n = 223$)	3.83 (.408)
All of the time, n (%)	188 (76)
Most of the time, n (%)	31 (13)
Sometimes, n (%)	3 (1.2)

pounds. Women reported consuming 3.25 ± 1.9 servings of fruits and vegetables per day. Of women referred to cardiac rehabilitation (CR), 52% completed or partially completed the program. Most women (76%) reported adherence to prescribed medications. Self-care activation was positively associated with weekly minutes of physical activity ($r = 0.184$, $P = .004$) and fruit and vegetable consumption ($r = 0.142$, $P = .028$), negatively associated with BMI ($r = -0.227$, $P < .001$), and unrelated to medication adherence ($r = 0.039$, $P = .569$; data not shown in the table). Social support was correlated with BMI ($r = -0.130$, $P = .045$) but not with physical activity, fruit and vegetable consumption, or medication adherence (data not shown in the table).

Predictors of self-care behaviors

Multiple linear regression modeling with backward elimination was used to examine variables associated with physical activity, BMI, and fruit and vegetable consumption. Plausible explanatory variables included self-care activation, social support, and the ADL total score. The associations of self-perceived health status (poor, fair, good, very good, excellent; Table 2), bodily pain, education, income, smoking status, and support group attendance with self-care behaviors were also examined. Table 7 presents the final model of variables significantly associated with physical activity. Self-care activation and the ADL total score were significantly positively associated with minutes of physical activity, whereas being a current smoker was negatively linked with physical activity. These variables explained 12.4% of the variance in physical activity, $R^2 = 0.124$; $F(3,237) = 11.17$, $P < .001$.

Variables significantly associated with higher BMI included low self-care activation (standardized beta coefficient [B] = -0.160), poor self-perceived health status (B = -0.168), greater limitations with ADLs (B

Table 7. Predictors of minutes of physical activity per week ($n = 246$).^a

Predictor	Unstandardized coefficient (B)	Standard error	Standardized coefficient (B)
Intercept	-0.110	69.62	
Self-care activation	2.429*	1.148	0.133
ADL total	10.918*	4.907	0.154
Current smoker	-24.602*	8.584	-0.198

^aADL indicates activities of daily living; variables removed from the model through backward elimination: overall perceived health, bodily pain, difficulty doing ADLs due to physical health, education, support group attendance. $R^2 = 0.124$; $F(3,237) = 11.17$, $P < .001$; adjusted $R^2 = 0.113$.
* $P < .05$.

Table 8. Predictors of body mass index ($n = 240$).^a

Predictor	Unstandardized coefficient (B)	Standard error	Standardized coefficient (B)
Intercept	44.448	3.598	
Self-care activation	-0.161*	0.062	-0.160
Self-perceived health status	-1.319*	0.583	-0.168
Bodily pain	0.724	0.419	0.116
ADL total	-0.725*	0.294	-0.184
Years with heart failure	-0.124*	0.058	-0.127

^aADL indicates activities of daily living; variables removed from the model through backward elimination: social support, current smoker, former smoker, and income. $R^2 = 0.206$; $F(5,235) = 12.19$, $P < .001$; adjusted $R^2 = .189$.
* $P < .05$.

Table 9. Predictors of fruit and vegetable consumption ($n = 237$).^a

Predictor	Unstandardized coefficient (B)	Standard error	Standardized coefficient (B)
Intercept	0.431	0.519	
Self-perceived health status	0.437*	0.116	0.232
Education	0.268*	0.058	0.285
Income	0.084*	0.039	0.130

^aVariables removed from the model through backward elimination: self-care activation, activities of daily living total score, bodily pain, years living with heart failure, and difficulties doing activities of daily living due to physical or emotional problems. $R^2 = 0.191$; $F(3,234) = 18.41$, $P < .001$; adjusted $R^2 = 0.181$.
* $P < .05$.

= -0.184), and increased years living with HF (B = -0.127; Table 8). These predictors accounted for 20.6% of the variance in BMI, $R^2 = 0.206$; $F(5,235) = 12.19$; $P < .001$.

Finally, significant predictors of daily servings of fruits and vegetables included self-perceived health status (B = 0.232), higher level of education (B = 0.285), and higher income (B = 0.130; Table 9). These variables accounted for 19.1% of variance in fruit and vegetable consumption, $R^2 = 0.191$; $F(3, 234) = 18.41$, $P < .001$.

Discussion

Our study investigated the relationships among self-care activation, social support, self-perceived health status, ADLs, and health behaviors among women living with HF. Our major findings showed that significant predictors of weekly physical activity minutes included self-care

activation, ADL total score, and current tobacco use. Low self-care activation, poor self-perceived health, greater ADL limitations, and more years living with HF were statistically significantly associated with having a higher BMI. Self-perceived health status and education and income levels were significant predictors of daily fruit/vegetable servings. These findings support the need for Certified Health Education Specialists to tailor their education to raising self-care activation, improving health perceptions, and accommodating ADL limitations as well as to individuals' education and health literacy levels.

It is interesting to note that though the literature shows that almost 50% of individuals with HF will die within 5 years,² our sample had been living with HF for an average of 7.6 years. We believe that our study's sample was vulnerable to self-selection bias. Our sample of women had shown to be proactive by the fact that they found WomenHeart and opted to be included in WomenHeart's database. WomenHeart database members receive regular announcements, support group information, and invitations to events. Not only have these women living with HF shown to be proactive about seeking information and support but they are keeping current with breaking heart-related medical news through WomenHeart's ongoing communications, and many get involved in heart Health Education activities.

That said, the majority of women with HF in this study reported suboptimal self-care behaviors. Most women in the study were overweight, engaged in an average of only 10 min a day of moderate physical activity—less than the American Heart Association—recommended minimum 150 min of moderate physical activity per week,³⁵ and consumed approximately 3 servings of fruits and vegetables daily—less than the American Heart Association—recommended minimum 5 daily servings.³⁶ The comorbidities reported by one third of the women, including previous myocardial infarction, coronary heart disease, depression, anxiety, and diabetes mellitus, had an impact on their daily lives. Others have found that managing multiple chronic illnesses moderates the relationship between self-efficacy and self-care maintenance, interfering with individuals' abilities to adhere to HF treatments.³⁷ These findings point to the need for Certified Health Education Specialists to redouble their efforts in providing sex- and gender-specific information to improve health behaviors and to foster self-efficacy across multiple chronic conditions among women with HF.

More than one third of our respondents reported a good overall self-perceived health status. This generally positive view of one's own health status may reflect the concept of social comparison, in which individuals make

comparisons with each other and that may affect their psychological and physical well-being.³⁸ That is, women with HF may compare their health to other women living with HF and consequently perceive their health as comparatively better and generally good. For example, in this study, if respondents could climb stairs or walk a few blocks, which we found were positively associated with good self-perceived health status, they may have perceived their health as better than other women with HF. Notably, positive self-perceived health status and higher education and income were significantly related to greater fruit and vegetable consumption in individuals with HF. Conversely, poor health self-perceptions were associated with higher BMI, greater physical and emotional health problems, and bodily pain. Self-perceived poor health is a powerful predictor of worsening health, mortality, and exercise tolerance.^{39,40} Assessing individuals' self-perceived health status can assist Certified Health Education Specialists with tailoring interventions to match self-perceptions and with individualizing interventions for physical activity, pain management, and emotional problems. Moreover, respondents who smoked cigarettes engaged in less physical activity, providing yet another reason that Health Educators should intensify their efforts to counsel currently smoking individuals with HF to quit.

The self-care activation scores and the social support scores were moderate to high. This may explain the association we found between self-care activation (the ability to take independent actions to manage HF) and greater physical activity and lower BMI among our respondents. On the other hand, social support was not significantly associated with physical activity or weight management. The protective associations of higher fitness levels are even stronger for HF than for myocardial infarction.⁴¹ In a diverse sample of postmenopausal women, a healthy lifestyle was inversely associated with HF risk, independent of other atherogenic HF risk factors.⁴² Collectively, these studies support the health benefits of self-care behaviors for preventing and managing HF. Though higher levels of self-care activation were associated with the health behaviors of physical activity and more acceptable BMI, neither social support nor self-care activation were predictive of fruit and vegetable consumption. These prediction models explained only about 21% of the variance in self-care behaviors. Thus, additional research is warranted to both strengthen individual levels of self-care activation and identify factors that foster or serve as barriers to implementing important health behaviors.

A study, echoing data in our study, found 9 variables associated with poor self-management activation: age, high BMI, low education level, financial distress, multiple

comorbidities, poor physical health, depression, negative illness perception, and low social support.⁴³ Early interventions with education and support for self-care could help women with HF preserve their health status. Evidence suggests that coaching that is tailored to self-care activation level may further increase activation and lower hospitalizations.⁴⁴ Continued efforts to promote self-care activation and improve health knowledge, self-efficacy, and confidence in women living with HF—ideally through tailored coaching—are warranted.

Indeed, based on our finding that positive self-perceived health was significantly associated with the ability to climb stairs, walk several blocks, and carry groceries, Certified Health Education Specialists could underscore the value of accomplishing these tangible activities in order to improve overall health perceptions. Improving overall self-perceived health status may lead to adopting even more health behaviors. Perceived self-efficacy in the ability to perform these tasks may mediate performance of future tasks.⁴⁵

Although self-care activation was more strongly associated with self-care behaviors than was social support, social support and relationship quality between individuals and informal caregivers, such as family members, are deemed important for the health and well-being of both individuals and caregivers.⁴⁶ Individuals with heart failure who have high-quality marriages, for example, appear to live longer than individuals with poor-quality marriages, and this may be especially true for women.⁴⁷ Though studies report that family can support the development of self-care skills in individuals with HF,⁴⁸⁻⁵¹ most report a limited effect of social support on HF self-care. Thus, the effects of social support of individuals with HF are complex. Additional research on the influences of social support for women with HF is needed.

Medication nonadherence, estimated to be 40% to 60% in individuals with HF,⁵² is an important contributor to rehospitalization.⁵³ Most women in our study reported high medication adherence, although this might reflect an element of social desirability in the responses. These women also had numerous comorbidities, adding complexity to the medication regimen of individuals with HF.⁵⁴ Multiple chronic illnesses also moderate the relationship between self-efficacy and self-care maintenance, interfering with individuals' abilities to adhere to HF treatments.³⁷

Only 37% of women in our study reported completing a CR program, and another 15% attended only part of these secondary prevention interventions. Women are less likely to be referred to CR or complete an exercise program even though they are twice as likely as men to have HF after a myocardial infarction or revascularization.⁵⁵ Because

women with HF participating in exercise training in the HF-ACTION trial had a 26% reduction in all-cause death or all-cause hospitalization,⁵⁵ referrals to and enrollment in CR must increase. Additional benefits of exercise among individuals with HF include increased exercise capacity and improved diastolic function, endothelial function, and quality of life.⁵⁶ Individuals are monitored by a multidisciplinary team of nurses, exercise physiologists, dieticians, and physicians in CR interventions, which provides an ideal venue for supporting HF self-care. These highly skilled health educators in CR can facilitate management of individuals with HF through a combination of exercise training, education, and promotion and monitoring of self-management skills.

Limitations

Failing to engage minority women, disproportionately affected by HF and underrepresented in clinical trials,⁵⁷ is a limitation of our study. Generalizability of these data to all women with HF may be limited because the study sample was not randomly selected, most respondents were Caucasian, and the HF diagnosis was self-reported and not verified. Because of the cross-sectional design, discussions of causation are not possible. Potentially eligible women without access to computers or the Internet are also not represented. Although the sample size ($n = 246$) may be considered relatively small, this study did not aim to achieve a demographically representative sample; rather, our aim was to include a convenience sample of women living with HF who agreed to respond to an online survey over the course of 2 weeks. Because the invitation to complete the survey emanated from multiple online WomenHeart communication channels through which total recipient numbers are unknown, it is impossible to calculate a response rate. Nonetheless, this study adds to the body of literature on the challenges of women living with HF.

Translation to Health Education Practice

One prospective epidemiological 16-year follow-up study in Denmark that analyzed the association between self-rated health and the incidence of fatal and nonfatal coronary heart disease found self-rated health to be an independent predictor of coronary heart disease.⁵⁸ Another study concluded that a subjective health assessment is a valid health status indicator in middle-aged populations and recommended that it be used in population health monitoring.⁵⁹ The health care team, inclusive of Certified Health Education Specialists, makes an important contribution to improving the longevity and quality of life for women

with HF. Assessing self-perceived health status can assist Health Educators in the tailoring of appropriate interventions, including physical activity, mental health and support services, and medication adherence routines.

Providing counseling on smoking cessation for all current smokers is also critically important. Health Educators need to identify subgroups of women with HF who are at risk of self-care knowledge deficits and poor self-care behaviors. Older women, for example, who have a greater burden of chronic illness are likely to have the greatest need for tailored self-care interventions.⁶⁰ Women with poor self-care activation are at particular risk for suboptimal self-care behaviors.

Self-care management interventions must be designed to reflect the unique educational, emotional, and physical health needs of women. This study, and previous research, shows that too few women with HF are referred to CR interventions, and not all those who are referred complete the program. Recruiting more women to HF self-management trials will inform the development of effective strategies for improving outcomes and lend support for the health benefits of self-care behaviors for managing HF. Given the significant burden of HF, effective home-based HF interventions will positively affect rising health care costs and could decrease readmission rates and mortality.^{61,62}

Our study addressed the 2010 Certified Health Education Specialists Areas of Responsibilities #1, #2, #3, and #7.⁶³ We assessed the needs, assets, and capacity for health education by identifying factors that influence health behaviors and the social and environmental conditions that need to be considered when providing health education to women with HF (#1). We involved the priority population—women with HF—in planning Health Education by asking them what they knew and how they perceived their health (#2). These assessment results will inform a plan of action, inclusive of a training plan, for Health Educators who see the priority population (#3). In addition, our study results can empower Health Educators in their communication and advocacy efforts specific to women with HF (#7).

Conclusions

Self-care management of health behaviors is both a goal and a challenge for women living with HF. Self-care activation and activities of daily living scores of 246 women with HF in our study were significantly associated with weekly moderate-intensity physical activity. Moreover, low self-care activation, poor self-perceptions of health, and increased years living with HF were

associated with higher BMI. Conversely, only education and income were associated with fruit and vegetable consumption. Additional individual-centered research that focuses on strategies to improve disease-specific knowledge and enhance self-management skills of women with HF is warranted. Women with HF should be referred to either home-based HF interventions or center-based CR interventions, which are ideal venues for supporting comprehensive self-care. Because audience-tailored Health Education products are the most effective,⁶⁴ we will use the results of this study to fine-tune the messages, Health Education materials, and policy recommendations that WomenHeart will be designing to address the needs of women living with HF.

References

- Ditewig JB, Blok H, Havers J, van Veenendaal H. Effectiveness of self-management interventions on mortality, hospital readmissions, chronic heart failure hospitalization rate and quality of life in patients with chronic heart failure: a systematic review. *Patient Educ Couns*. 2010;78:297–315.
- Mozaffarian D, Benjamin EJ, Go AS, et al. Heart disease and stroke statistics—2016 update: a report from the American Heart Association. *Circulation*. 2016;133:e38–e60.
- Lee KS, Lennie TA, Dunbar SB, et al. The association between regular symptom monitoring and self-care management in patients with heart failure. *J Cardiovasc Nurs*. 2015;30:145–151.
- Jessup M, Abraham WT, Casey DE, et al. 2009 Focused update: ACCF/AHA guidelines for the diagnosis and management of heart failure in adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines: developed in collaboration with the International Society for Heart and Lung Transplantation. *Circulation*. 2009;119:1977–2016.
- Riegel B, Carlson B, Glaser D. Development and testing of a clinical tool measuring self-management of heart failure. *Heart Lung*. 2000;29:4–15.
- Riegel B, Carlson B, Moser D, Sebern M, Hicks FD, Roland V. Psychometric testing of the self-care of heart failure index. *J Card Fail*. 2004;10:350–360.
- Riegel B, Jaarsma T, Stromberg A. A middle-range theory of self-care of chronic illness. *ANS Adv Nurs Sci*. 2012;35:194–204.
- Evangelista LS, Rasmussen KD, Laramée AS, et al. Health literacy and the patient with heart failure—implications for patient care and research: a consensus statement of the Heart Failure Society of America. *J Card Fail*. 2010;16:9–16.
- Lainscak M, Blue L, Clark AL, et al. Self-care management of heart failure: practical recommendations from the Patient Care Committee of the Heart Failure Association of the European Society of Cardiology. *Eur J Heart Fail*. 2011;13:115–126.
- Riegel B, Moser DK, Anker SD, et al. State of the science: promoting self-care in persons with heart failure: a scientific statement from the American Heart Association. *Circulation*. 2009;120:1141–1163.
- Dickson VV, Tkacs N, Riegel B. Cognitive influences on self-care decision making in persons with heart failure. *Am Heart J*. 2007;154:424–431.
- Dracup K, Moser DK, Pelter MM, et al. Randomized, controlled trial to improve self-care in patients with heart failure living in rural areas. *Circulation*. 2014;130:256–264.
- Powell LH, Calvin JE Jr, Richardson D, et al. Self-management counseling in patients with heart failure: the Heart Failure Adherence and Retention Randomized Behavioral Trial. *JAMA*. 2010;304:1331–1338.
- Kitsiou S, Pare G, Jaana M. Effects of home telemonitoring interventions on patients with chronic heart failure: an overview of systematic reviews. *J Med Internet Res*. 2015;17:e63.
- Boyne JJ, Vrijhoef HJ, Spreeuwenberg M, et al. Effects of tailored telemonitoring on heart failure patients' knowledge, self-care, self-efficacy and adherence: a randomized controlled trial. *Eur J Cardiovasc Nurs*. 2014;13:243–252.
- Gorst SL, Armitage CJ, Brownsell S, Hawley MS. Home telehealth uptake and continued use among heart failure and chronic obstructive pulmonary disease patients: a systematic review. *Ann Behav Med*. 2014;48:323–336.
- Lindenfeld J, Albert NM, Boehmer JP, et al. Heart Failure Society of America 2010 comprehensive heart failure practice guideline. *J Card Fail*. 2010;16:e1–e194.
- McMurray JJ, Adamopoulos S, Anker SD, et al. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. *Eur Heart J*. 2012;33:1787–1847.
- Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA guideline for the management of heart failure: executive summary: a report of the American College of Cardiology Foundation/American Heart Association Task Force on practice guidelines. *Circulation*. 2013;128:1810–1852.
- Jaarsma T, van der Wal MH, Lesman-Leege I, et al. Effect of moderate or intensive disease management program on outcome in patients with heart failure: Coordinating Study Evaluating Outcomes of Advising and Counseling in Heart Failure (COACH). *Arch Intern Med*. 2008;168:316–324.
- Hibbard JH, Mahoney ER, Stockard J, Tusler, M. Development and testing of a short form of the patient activation measure. *Health Serv Res*. 2005;40:1918–1930.
- Lorig K, Stewart A, Ritter P, González V, Laurent D, Lynch J. *Outcome Measures for Health Education and Other Health Care Interventions*. Thousand Oaks, CA: SAGE; 1996.
- Stansfeld SA, Roberts R, Foot SP. Assessing the validity of the SF-36 General Health Survey. *Qual Life Res*. 1997;6:217–224.

24. Jenkinson C, Wright L, Coulter A. Criterion validity and reliability of the SF-36 in a population sample. *Qual Life Res.* 1994;3:7–12.
25. Failde I, Ramos I. Validity and reliability of the SF-36 Health Survey Questionnaire in patients with coronary artery disease. *J Clin Epidemiol.* 2000;53:359–365.
26. Findler M, Cantor J, Haddad L, Gordon W, Ashman T. The reliability and validity of the SF-36 Health Survey questionnaire for use with individuals with traumatic brain injury. *Brain Inj.* 2001;8:715–723.
27. Zhang Y, Qu B, Lun SS, Guo Y, Liu J. The 36-Item Short Form Health Survey: reliability and validity in Chinese medical students. *Int J Med Sci.* 2012;9:521–526.
28. Scott KM, Tobias MI, Sarfati D, Haslett SJ. SF-36 Health Survey reliability, validity and norms for New Zealand. *Aust N Z J Public Health.* 1999;23:401–406.
29. Sinha R, van den Heuvel WJ, Arokiasamy P. Validity and reliability of MOS Short Form Health Survey (SF-36) for use in India. *Indian J Community Med.* 2013;38:22–26.
30. Lim LL, Seubsman SA, Sleigh A. Thai SF-36 Health Survey: tests of data quality, scaling assumptions, reliability and validity in healthy men and women. *Health Qual Life Outcomes.* 2008;6:52.
31. Frempong-Ainguah F, Hill A. Reliability, validity and responsiveness of the Short Form-36 Health Survey: findings from the Women's Health Study of Accra, Ghana. *Quetelet Journal.* 2014;2:7–29.
32. Beckie TM, Fletcher GF, Beckstead JW, Schocken DD, Evans ME. Adverse baseline physiological and psychosocial profiles of women enrolled in a cardiac rehabilitation clinical trial. *J Cardiopulm Rehabil Prev.* 2008;28:52–60.
33. Mitchell PH, Powell L, Blumenthal J, et al. A short social support measure for patients recovering from myocardial infarction: the ENRICH Social Support Inventory. *J Cardiopulm Rehabil.* 2003;23:398–403.
34. Vaglio J, Jr, Conard M, Poston WS, et al. Testing the performance of the ENRICH Social Support Instrument in cardiac patients. *Health Qual Life Outcomes.* 2004;2:24.
35. American Heart Association. American Heart Association Recommendations for Physical Activity in Adults. http://www.heart.org/HEARTORG/HealthyLiving/PhysicalActivity/FitnessBasics/American-Heart-Association-Recommendations-for-Physical-Activity-in-Adults_UCM_307976_Article.jsp#.V7cYIVc3eCM. Updated July 27, 2016. Accessed August 19, 2016.
36. American Heart Association. Eat More Fruits and Vegetables. http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/Eat-More-Fruits-and-Vegetables_UCM_320237_Article.jsp#.V7ccb1c3eCM. Updated February 17, 2016. Accessed August 19, 2016.
37. Dickson VV, Buck H, Riegel B. Multiple comorbid conditions challenge heart failure self-care by decreasing self-efficacy. *Nurs Res.* 2013;62:2–9.
38. Arigo D, Suls JM, Smyth JM. Social comparisons and chronic illness: research synthesis and clinical implications. *Health Psychol Rev.* 2014;8:154–214.
39. Farkas J, Nabb S, Zaletel-Kragelj L, Cleland JG, Lainscak M. Self-rated health and mortality in patients with chronic heart failure. *Eur J Heart Fail.* 2009;11:518–524.
40. Havranek EP, Lapuerta P, Simon TA, L'Italien G, Block AJ, Rouleau JL. A health perception score predicts cardiac events in patients with heart failure: results from the IMPRESS Trial. *J Card Fail.* 2001;7:153–157.
41. Berry JD, Pandey A, Gao A, et al. Physical fitness and risk for heart failure and coronary artery disease. *Circ Heart Fail.* 2013;6:627–634.
42. Agha G, Loucks EB, Tinker LF, et al. Healthy lifestyle and decreasing risk of heart failure in women: the Women's Health Initiative observational study. *J Am Coll Cardiol.* 2014;64:1777–1785.
43. Bos-Touwen I, Schuurmans M, Monninkhof EM, et al. Patient and disease characteristics associated with activation for self-management in patients with diabetes, chronic obstructive pulmonary disease, chronic heart failure and chronic renal disease: a cross-sectional survey study. *PLoS One.* 2015;10(5):e0126400.
44. Shively MJ, Gardetto NJ, Kodiath MF, et al. Effect of patient activation on self-management in patients with heart failure. *J Cardiovasc Nurs.* 2013;28:20–34.
45. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot.* 1997;12:38–48.
46. Hooker SA, Grigsby ME, Riegel B, Bekelman DB. The impact of relationship quality on health-related outcomes in heart failure patients and informal family caregivers: an integrative review. *J Cardiovasc Nurs.* 2015;30:S52–S63.
47. Rohrbaugh MJ, Shoham V, Coyne JC. Effect of marital quality on eight-year survival of patients with heart failure. *Am J Cardiol.* 2006;98:1069–1072.
48. Dickson VV, Riegel B. Are we teaching what patients need to know? Building skills in heart failure self-care. *Heart Lung.* 2009;38:253–261.
49. Dunbar SB, Clark PC, Quinn C, Gary RA, Kaslow NJ. Family influences on heart failure self-care and outcomes. *J Cardiovasc Nurs.* 2008;23:258–265.
50. Dunbar SB, Clark PC, Reilly CM, et al. A trial of family partnership and education interventions in heart failure. *J Card Fail.* 2013;19:829–841.
51. Sayers SL, Riegel B, Pawlowski S, Coyne JC, Samaha FF. Social support and self-care of patients with heart failure. *Ann Behav Med.* 2008;35:70–79.
52. Wu JR, Moser DK, Lennie TA, Burkhart PV. Medication adherence in patients who have heart failure: a review of the literature. *Nurs Clin North Am.* 2008;43:133–153.
53. Riegel B, Knafl GJ. Electronically monitored medication adherence predicts hospitalization in heart failure patients. *Patient Prefer Adherence.* 2013;8:1–13.
54. Mastromarino V, Casenghi M, Testa M, et al. Polypharmacy in heart failure patients. *Curr Heart Fail Rep.* 2014;11:212–219.
55. Pina IL, Bittner V, Clare RM, et al. Effects of exercise training on outcomes in women with heart failure: analysis of HF-ACTION (Heart Failure—A

- Controlled Trial Investigating Outcomes of Exercise TraiNing) by sex. *JACC Heart Fail.* 2014;2:180–186.
56. Ades PA, Keteyian SJ, Balady GJ, et al. Cardiac rehabilitation exercise and self-care for chronic heart failure. *JACC Heart Fail.* 2013;1:540–547.
 57. Okin PM, Kjeldsen SE, Dahlof B, Devereux RB. Racial differences in incident heart failure during antihypertensive therapy. *Circ Cardiovasc Qual Outcomes.* 2011;4:157–164.
 58. Møller L, Kristensen TS, Hollinagel H. Self rated health as a predictor of coronary heart disease in Copenhagen, Denmark. *J Epidemiol Community Health.* 1996;50:423–428.
 59. Miilunpalo S, Vuori I, Oja P, Pasanen M, Urponen H. Self-rated health status as a measure: the predictive value of self-reported health status on the use of physician services and on mortality in the working-age population. *J Clin Epidemiol.* 1997;50:517–528.
 60. Dennison CR, McEntee ML, Samuel L, et al. Adequate health literacy is associated with higher heart failure knowledge and self-care confidence in hospitalized patients. *J Cardiovasc Nurs.* 2011;26:359–367.
 61. Giordano A, Scalvini S, Zanelli E, et al. Multicenter randomised trial on home-based telemanagement to prevent hospital readmission of patients with chronic heart failure. *Int J Cardiol.* 2009;131:192–199.
 62. Hagglund E, Lynga P, Frie F, et al. Patient-centred home-based management of heart failure. Findings from a randomised clinical trial evaluating a tablet computer for self-care, quality of life and effects on knowledge. *Scand Cardio J.* 2015;49:193–199.
 63. National Commission for Health Education Credentialing, Inc., Society for Public Health Education, and American Association for Health Education. Areas of Responsibilities, Competencies, and Sub-competencies for Health Education Specialists 2010. https://www.nchec.org/assets/2251/areas_of_responsibilities_and_competencies.pdf. Published 2010. Accessed February 6, 2017.
 64. Schmid KL, Rivers SE, Latimer AE, Salovey P. Targeting or tailoring? Maximizing resources to create effective health communications. *Mark Health Serv.* 2008;28:32–37.