

Work–Heart Balance

The Influence of Biobehavioral Variables on Self-Care Among Employees With Heart Failure

by Victoria Vaughan Dickson, PhD, CRNP, Linda A. McCauley, PhD, RN, FAAN, and Barbara Riegel, DNSc, RN, CS, FAAN

RESEARCH ABSTRACT

The complexities of managing heart failure among employees have not been studied. In this mixed methods study, the authors explored how cognition, physical functioning, attitudes, and self-efficacy influence self-care among employees with heart failure. Forty-one adults (White, 68.3%; male, 63.4%; median age, 51 years; employed, 48.8%) completed in-depth interviews and standardized instruments. Content analysis was used to derive themes from narrative accounts of self-care practices, attitudes, and self-efficacy within the context of employment. Descriptive and nonparametric statistics were used to describe the sample and generate hypotheses about relationships among the variables. Most of the employed participants ($N = 13$) worked full-time (65%), primarily in sedentary jobs. Cognition and physical functioning were better in those who were employed ($p = .02$), but self-care practices were lower ($p = .03$). Those who successfully managed heart failure and work described strategies to incorporate self-care into their workdays, self-efficacy in managing symptoms while at work, and favorable attitudes toward employment.

Hearth failure affects an estimated 5 million Americans, with more than 500,000 new cases diagnosed every year (Rosamond et al., 2007). Although heart failure is generally viewed as a condition of the elderly, 8.9% of men and 5.4% of women with heart failure are of pre-retirement age (Phillips, Harrison, & Houck, 2005); thus, heart failure is an important health issue among working adults (Bureau of Labor Statistics, 2005). Hypertension and coronary artery disease, common etiologies of heart failure, pose significant health and disability issues for today's work force (Pfizer U.S. Pharmaceuticals, 2001). Hypertension, which precedes the development of heart failure in 91% of cases, affects 15% of the work force. More than 3.5 million workers have coronary artery disease; within 5 years after a recognized heart attack, approxi-

mately 7% of men and 12% of women will develop heart failure (Rosamond et al.). Although heart failure is a growing problem with significant health and productivity issues for working adults, little is known about the complexities of managing heart failure among employees. Furthermore, nurses are not prepared to either assess or provide resources for the safe and effective transition of individuals with heart failure into the work force (Phillips et al.).

This study explored self-care practices among employees with heart failure and examined how the biobehavioral variables known to influence self-care do so in this population. The authors found that a large proportion of individuals with heart failure want to return to work, but self-care may become less of a priority for those who do. Attitudes, self-efficacy, cognition, and physical functioning play a critical role in workers' ability to balance the demands of heart failure self-care with employment. Occupational health nurses play a critical role in supporting workers' employment capabilities.

ABOUT THE AUTHORS

Dr. Dickson is Adjunct Assistant Professor, Dr. McCauley is Associate Dean for Nursing Research, and Dr. Riegel is Associate Professor, University of Pennsylvania, School of Nursing, Philadelphia, PA.

BACKGROUND

Self-care, which includes both maintenance (treatment adherence) and management (decision-making) components, is considered the cornerstone of heart failure management. In this study, self-care was conceptualized as an active, cognitive process in which individuals engage for the purpose of maintaining their health or managing their disease and illness. Self-care is a naturalistic decision-making process. On a daily basis, as part of self-care practice, individuals with heart failure must engage in self-care maintenance (e.g., restricting dietary sodium, monitoring weight, restricting fluids, ceasing smoking, exercising, and taking medications). Self-care management of symptoms entails symptom recognition, interpretation, and treatment and evaluation of actions (Riegel et al., 2004). These self-care practices are associated with improved health outcomes including fewer hospitalizations, reduced emergency department use, and improved quality of life (Hershberger et al., 2001; Jaarsma et al., 2000). However, self-care is often practiced inconsistently in this population. For example, adherence to maintenance practices such as diet, medication, and symptom monitoring, essential to maintaining physiological stability of disease, has been found to depend on the situation (Reid, Clark, Murdoch, Morrison, & McMurray, 2006).

Maintaining employment when one is engaged in a complex treatment regimen is often difficult due to workplace barriers (e.g., job demands, supervisor and coworker support, and decision latitude; Weijman et al., 2005). In some populations, attitudes regarding work and chronic illness have been linked to self-efficacy, the ability to manage illness and continue working (Petrie, Weinman, Sharpe, & Buckley, 1996; Weijman et al.). Returning to work may also be a motivating force in the rehabilitation process (Maeland & Havik, 1987). Examining the influences of employment on heart failure self-care is important because the number of employees with heart failure continues to increase and the American work force as a whole is aging (Bureau of Labor Statistics, 2005).

The current literature is limited to return to work as an outcome of heart failure treatment (Deaton & Grady, 2004). Investigators have not addressed the complexities of managing heart failure among employees. Only one report regarding individuals with heart failure was located (Phillips et al., 2005). In their review of the literature, Phillips et al. reported a gap in knowledge regarding predictors for return to work and effective strategies to facilitate re-entry to the work force by those with heart failure.

Therefore, the current study addressed the research priorities of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, and National Occupational Research Agenda by investigating factors that influence health behaviors (self-care) in a special population (aging work force) to develop interventions that will improve the health and productivity of workers with a chronic illness (heart failure). Specifically, the purpose of this study was to explore how at-

titudes, self-efficacy, cognition, and physical functioning influence self-care among employees with heart failure.

METHODS

In this mixed methods study, qualitative data from semistructured interviews were used to identify attitudes and self-efficacy about heart failure self-care and to explore how attitudes and self-efficacy influence self-care practices. Quantitative data were collected using standardized instruments to examine the contribution of cognition and physical functioning to self-care.

Setting and Sample

After institutional review board approval was obtained, 41 participants were recruited from two outpatient settings affiliated with a large urban medical center. All participants provided written informed consent and were paid \$50 for completing the interview and surveys.

A purposive sampling frame was used to recruit a diverse group of participants with confirmed chronic heart failure. The use of a maximum variation sampling technique resulted in maximum heterogeneity on specific attributes (e.g., age, race, gender, heart failure class, employment status, occupation, and time with heart failure) anticipated to affect the variables of interest.

Individuals were eligible for participation if they had documented evidence of symptomatic heart failure (class II or III) for at least 3 months, were between the ages of 18 and 65, were employed within the past 2 years, and could speak and read English. Those with a history of a prior neurological event that could cause dementia or inability to perform tests (e.g., diagnosed dementia, unable to write or read in English, less than a 5th grade reading level, or major visual or hearing impairment) were excluded.

Participants were classified as employed if they reported current compensated work. The hours worked per week, reason for unemployment, length of unemployment, and employment history prior to sick leave were also collected. Those who reported currently working full- or part-time were categorized as "employed" and others were categorized as "unemployed." Participants also were grouped by job category.

Procedure

Within a single session, participants completed demographic and structured instruments and were interviewed about their attitudes, self-efficacy beliefs, heart failure self-care practices, and employment. Participants were asked about behavior-specific attitudes (i.e., the good and bad things anticipated from specific behaviors) and attitudes about employment, ability to manage heart failure self-care within the context of employment, and the effects of heart failure on their ability to work. Self-efficacy beliefs were elicited about circumstances under which performing self-care is more or less difficult, including the workday. These data provided the basis for identifying how attitudes and self-efficacy influence self-care within the context of employment. Self-care experi-

ences also were elicited during the interviews, including examples of successful and unsuccessful self-care situations at work and home.

Each interview lasted approximately 60 minutes. Field notes of participant observations supplemented the tape-recorded interviews.

Quantitative Data

Participants completed a brief sociodemographic survey and standardized instruments measuring self-care, cognition, and physical functioning.

Heart failure self-care was measured by the Self-Care of Heart Failure Index (SCHFI) (Riegel et al., 2004), a valid and reliable instrument with 17 items on a 4-point Likert scale. These items form three scales: self-care maintenance (those monitoring and adherence behaviors that prevent heart failure exacerbation), self-care management (the ability to recognize and respond appropriately to symptoms), and self-care confidence (perceived ability to engage in self-care). Scores on each of the SCHFI scales are standardized to 100; higher scores indicate better self-care. In this sample, the Cronbach alpha values were 0.55 for maintenance, 0.65 for management, and 0.86 for confidence.

Cognition was measured using three brief neurobehavioral tests: Digit Symbol Substitution Test (Lezak, Howieson, & Lorig, 2004), Probed Memory Recall test (Dinges, Kribbs, Bates, & Carlin, 1993), and Letter Number Sequencing Task (Cohen & Swerdlik, 2004). The Digit Symbol Substitution Test is a measure of psychomotor performance, attention, and ability to remember and operate using complex symbols. This timed test involves pairing numbers with corresponding symbols. Participants are shown a series of numbers with blank boxes immediately below them. A key at the top of the form shows the numbers corresponding to unique symbols. A higher score indicates accuracy and speed of visuospatial skills as well as the ability to "keep in mind" the symbols (i.e., use working memory). A deficit in this ability requires reference to the key, which slows performance or accuracy. The number completed correctly in 90 seconds was used in analysis. According to the test developers, test-retest reliability is adequate (0.86) (Gregory, 1999). A score of 26 or less on the Digit Symbol Substitution Test is consistent with a clinical cognitive deficit (Fried et al., 1998).

The Probed Memory Recall test evaluates recall and retention. Participants are given a list of four word pairs (e.g., box:ocean) to study for 30 seconds. Testing on other topics continues. Then, after 10 minutes, participants are given a list of one word from each of the pairs (in a different order) and must recall all four word pairs within 1 minute. Recall of only two of four words suggests memory is impaired (Dinges et al., 1993).

The Letter Number Sequencing Task is sensitive to deficits in attention, memory, and executive function (Gregory, 1999). It has adequate test-retest reliability (range = 0.73 to 0.77) (Lemay, Bedard, Rouleau, & Tremblay, 2004). Participants are read a series of letters and numbers in mixed order. The task requires that they

repeat the list with the numbers in ascending order and the letters in alphabetical order. For example, M-3-P-6 should be reordered to 3-6-M-P. Levels progress from two to eight items with three trials for each level. Success in this task requires attention, sequencing ability, mental manipulation, and processing speed. Slowed processing speed, inability to remember earlier responses, and reduced capacity to ignore irrelevant information all contribute to decrements in performance. The number of correct trials to reorder the sequence was used in the analysis. Scores lower than the norm of 10 on the Letter Number Sequencing Task suggest impaired working memory (Lemay et al.).

Physical functioning was measured using the Duke Activity Status Index (DASI) and the New York Heart Association (NYHA) classification. The 12 items on the DASI represent major aspects of physical function: personal care, ambulation, household tasks, sexual function, and recreational activity (Hlatky et al., 1989). In this study, the DASI had adequate reliability (Cronbach alpha = 0.86). The NYHA, a widely used classification system that relates functional activity to the ability to perform ordinary activities, was used to augment the DASI score and to describe the sample. A standardized questionnaire (Kubo et al., 2004) was used to measure NYHA class (Cronbach alpha = 0.75).

Analysis

More than 1,000 pages of transcription were analyzed using content analysis. Initially, within-case analysis focused on identifying key themes about self-care, attitudes, self-efficacy, and employment for each of the 41 participants. Themes were then examined across cases to identify commonalities. The within-case and across-case analyses was iterative processes; the principal investigator moved between individual cases and across cases to track variability of themes (Ayres, Kavanaugh, & Knafel, 2003).

Descriptive and nonparametric statistics were used to describe the participants' baseline demographics, illness characteristics, and physical functioning and to generate hypotheses about relationships among the variables. Due to the small sample size, medians, ranges, and nonparametric statistics were used. Means and standard deviations were used whenever appropriate. Analyses were performed using SPSS software (version 14.0; SPSS, Inc., Chicago, IL).

RESULTS

The 41 participants were predominately White (68.3%) and male (63.4%). Twenty participants (48.8%) were employed at the time of the study. The median number of hours worked per week was 40 (range = 4 to 80 hours per week). Of the 21 individuals classified as unemployed, 11 were on disability or sick leave, 6 had retired within the 2 years prior to the study, and 4 were unemployed but not on disability. For those on disability or sick leave, the median period of disability was 24 months.

Participants reported employment, past or current, in

Table 1

Demographics and Illness Characteristics by Employment Status of Individuals With Heart Failure

	<i>Employed (N = 20)</i>	<i>Unemployed (N = 21)</i>	<i>p</i>
Age (years)			
<i>M</i>	49.10	49.24	.89
<i>SD</i>	10.09	11.14	
Median	49	52	
Range	28 to 65	25 to 65	
Job category			
Clerical and sales	7 (35%)	6 (28.6%)	.27
Construction, manufacturing, agriculture	4 (20%)	8 (38.1%)	
Professional, technical, managerial	6 (30%)	2 (9.5%)	
Service related	3 (15%)	5 (23.8%)	
Length of heart failure (months)			
<i>M</i>	74.35	83.86	.43
<i>SD</i>	58.37	54.93	
Median	54	72	
Range	3 to 252	4 to 180	
Gender			
Male	12 (60%)	14 (66.7%)	.66
Female	8 (40%)	7 (33.3%)	
Ethnicity			
African American	4 (20%)	7 (33.3%)	.63
White	15 (75%)	13 (61.9%)	
Hispanic or Latino	1 (5%)	1 (4.8%)	
NYHA classification			
II	10 (50%)	7 (33.3%)	.28
III	10 (50%)	14 (66.7%)	
Marital status			
Married	11 (55%)	7 (33.3%)	.17
Single	9 (45%)	14 (66.6%)	
Education			
Less than high school	0	4 (19%)	.14
High school	7 (35%)	7 (33.3%)	
College	13 (65%)	10 (47.7%)	
Heart failure etiology			
Ischemic	4 (20%)	6 (28.6%)	.19
Hypertension	1 (5%)	4 (19%)	
Other	15 (75%)	11 (52.4%)	
Left ventricle ejection fraction			
<i>M</i>	41.35%	27.14%	.003*

SD	16.72%	17.36%	
Median	40%	20%	
Minimum	15%	5%	
Maximum	85%	80%	
Type of heart failure			
Systolic	15 (75%)	18 (85.7%)	.52
Diastolic	3 (15%)	1 (4.8%)	
Mixed	2 (10%)	2 (9.5%)	

Note. NYHA = New York Heart Association.
*p < .05 (Mann-Whitney U test).

a diverse range of occupations. However, a greater percentage of participants in job categories characterized typically by sedentary work (i.e., clerical work [71.4%] or professional [83.3%]) were employed than those in occupations associated with demanding physical work (e.g., construction [40%] or service related [33.3%]).

The ages of the entire sample ranged from 25 to 65 years (median = 51 years). Most (58.5%) were NYHA classification III with a median length of illness of 6 years (range = 3 months to 21 years). Most participants had systolic heart failure (81%) and most had an implanted device to control heart rhythm (73%). No statistically significant differences in demographic data by employment status were found, although those who were unemployed had significantly lower ejection fractions ($p = .003$) than those who reported working (Table 1).

Qualitative Findings

Recurrent themes describing heart failure self-care within the context of being employed included intrinsic and extrinsic rewards of employment, the effects of heart failure on the ability to work, and the ability to manage heart failure self-care while working.

Most of the employed participants (70%) reported intrinsic rewards of employment (e.g., working improved their mood, enhanced mental activity, and increased social interaction). They relayed feeling bored, isolated, or depressed when previously on disability due to heart failure: "I was home . . . for about a month . . . I was going nuts at home." For some, work was essential to their sense of self (e.g., "Working is part of my identity . . . I've been working since I was 16."). Others associated working with contributing to society. One man who was unable to work in his construction job explained:

. . . sometimes I feel like I'm not contributing to society and that bugs me. I feel like I'm not helping to support my family, I mean the money is coming in but I don't feel like I'm worthy that I should be receiving any. Before, I went out and did an honest day's work and got paid for it . . .

Extrinsic rewards associated with employment status were primarily financial. Half of the employed participants worked for financial gain: "I want to continue to work because of the financial rewards . . . the cost of

medication—that is a lot. You do worry about the cost of it all." This theme was also found in the unemployed group when the financial benefits of being unemployed (i.e., disability insurance) were essential to meeting health care costs associated with having heart failure. For some, the financial advantage of unemployment exceeded the intrinsic rewards of employment and influenced the decision to remain out of work. One female participant on disability for the previous 12 months described her attitude toward employment as a Catch-22:

I tried thinking about going back to work . . . the Catch-22 about that is it affects my disability. . . . I wouldn't be able to support myself. . . . It's really a hard situation. . . . I can't do anything else except that (part-time work), but my medicine . . . is too expensive. . . .

Job Satisfaction. Generally, job satisfaction was associated with favorable attitudes toward working, whereas job dissatisfaction or ambivalence was described by those who had unfavorable attitudes toward employment, as illustrated in the two examples that follow. A 35-year-old employed woman expressed favorable attitudes (i.e., both intrinsic and extrinsic rewards) from working:

I love what I do and the fact that I am good at it and am recognized for my abilities . . . and I'm providing for my family. That is important to me to be able to support them. I have three kids and I like the car that I drive . . .

In contrast, a 62-year-old participant who accepted an early retirement option that was more advantageous than continuing to work with heart failure stated: "It was a job that I needed to make a living and that is why I worked and only that."

How Does Heart Failure Affect the Ability to Work?

Eighteen individuals reported that the burden of heart failure and its symptoms prevented them from returning to work or remaining actively employed. Heart failure symptoms and health restrictions that interfered with the ability to perform job functions were the primary reasons individuals with heart failure were unemployed or retired. Problems with cognition, primarily lack of concentration and forgetfulness, also interfered with the ability to work:

. . . the lack of concentration . . . I have a hard time concentrating . . . all of a sudden—the mind, people will

tell you things and you'll go blank, you won't remember, that's the hardest part. . . .

Most of those who were unemployed (62%) reported that fatigue and activity intolerance made working difficult, especially when the job was physically demanding. One man on disability from his construction job described his attempt to return to work after diagnosis and subsequent inability to remain employed due to heart failure symptoms and physical restrictions:

. . . I work in construction. The last time when I went back to work . . . I just kept pushing and pushing and trying to . . . it took me a while to accept that I couldn't do it, I just couldn't do it. . . . The guys who I worked with I've been working with them for 20 years, they put me in the office. They gave me light duty . . . but just trying to be to the job site at 7 o'clock . . . I was just tired and fatigued. That's the hardest thing to accept that you're just tired. . . .

Heart failure also influenced ability to change jobs for several participants and prompted retirement for some (e.g., ". . . I'd have to learn a new job, knowing how forgetful . . . knowing my memory was so bad I didn't think it was going to work out too well for me. . .").

Health care providers, either personal providers or the occupational health staff at the workplace, frequently enforced a decision not to work. Individuals with positive attitudes toward employment often tried to negotiate return to work despite objections by their providers. However, when the physical limitations of heart failure affected the ability to perform the job, safety issues drove the employment decision. As this auto mechanic describes, heart failure affected his ability to be safe on the job:

I started getting tired to the point where I was getting dizzy at work. It just finally got to the point where I couldn't do it anymore . . . I passed out several times at work. The doctor said, 'I'm gonna take you out of work. You shouldn't be working.' I'd gotten so bad, the doctor said, 'We can only do so much.'

Those in occupations that were more sedentary reported fewer difficulties and restrictions related to their heart failure when performing job functions: "I'm an accountant. So I basically sit in front of a computer . . . data entry type of work." Several participants had negotiated Americans with Disabilities Act (ADA) accommodations that enabled them to remain actively employed despite physical limitations and often the objections of their health care providers. These accommodations included modification of job duties such as lifting restrictions, flexible work arrangements to accommodate appointments with health care providers, and work at home assignments. Accommodations that removed barriers and alleviated the burden imposed by heart failure symptoms led to success in staying employed with heart failure. As a 47-year-old computer programmer explained, the benefits of an accommodation facilitated by his health care provider extended beyond the financial rewards of employment:

When I went back to work, I worked with the people at the heart failure clinic and they put in a claim for me with the Americans with Disabilities Act . . . what my limitations were, that I should work part-time, and that

I should work from home because I did computers. So I can work from home without a problem. That's been huge because I don't know if I would have made it the past 2 years sitting at home. I would literally have climbed the walls. I would have run out of money. I would have had to sell this house. That's been incredibly important for me, huge . . . having work and having something constructive and important to do and enjoying my job and knowing that my company is satisfied with what I do and at the same time not having to go into the office . . . only working 6 hours a day instead of a full 8 hours. I get that sense of accomplishment. But I also get the sense of I'm taking care of myself at the same time.

How Does Working Affect Heart Failure Self-Care?

Twenty-three participants reported that working did not interfere with heart failure self-care. These individuals had developed strategies of *making it fit* that facilitated self-care within the context of their employment. The support of employers and coworkers was essential to the practice of heart failure self-care during the workday. Table 2 provides several examples of how self-care was enhanced by employment.

For those who struggled with heart failure self-care and working, diminished self-efficacy was the predominant theme that emerged to explain the difficulties these individuals had in practicing self-care at work or while performing their jobs. For example, diuretic titration was often difficult during the course of a workday. Many individuals managed their daily diuretic dose around the priorities of a workday: ". . . if I have a meeting at work, I have to put off taking (Lasix[®]) until I can have access to a bathroom . . ." When additional diuretics were necessary in response to fluid retention or weight gain, they had to prioritize the increased urination with workload. In these cases, most actually deferred taking the extra diuretic rather than disrupt their workday. One accountant who worked out of his home but sometimes had to travel long distances by car explained, "There are circumstances that I'm not going to take an extra water pill . . . if I have to go into the city, I don't want to get stuck in traffic . . ."

Time constraints associated with working led to difficulty with adherence to a low sodium diet and exercise. Employed participants reported more frequent lapses in diet than those who were unemployed, usually related to convenience (e.g., "If I'm running late at work, I might pick up fast food on the way home as opposed to cooking something at home. It's a matter of time . . .").

Work-Heart Balance. An overarching theme that emerged from these narratives of heart failure self-care within the context of employment was *work-heart balance*. Individuals who described work-heart balance were able to successfully manage heart failure and employment by developing strategies to incorporate the day-to-day activities of self-care maintenance (e.g., symptom monitoring, diet adherence, medication routines, and exercise) into their daily work routines. Similarly, they successfully balanced symptom recognition and evaluation and treatment implementation and evaluation with the demands of their jobs. They did not ignore symptoms or avoid treatment such as diuretic titration due to work

Table 2

Components of Self-Care Practice and Examples of *Making It Fit at Work*

Self-Care Practice	Example of Making It Fit at Work
Treatment implementation: diuretic titration	"Over the years I learned if I take my Lasix [®] and I drive to work, by the time I get to work I have to go"
Energy conservation	"I try to limit how much I have to do. Like today, we have graduate students and a dinner meeting. . . . I will go home and get some rest, then come back for it (dinner meeting)."
Symptom monitoring: daily weights	"I go out to the dock, we're a manufacturing company, so I go out there, talk to the guys, hit the scale"
Diet adherence	"I'm 2 miles away from work, so I'll pack lunch. She'll (wife) make me a pack lunch—I won't go out, or I'll come home for lunch"
Medication routine	"I take my pills with me to work, so they sit on my desk. I take them out of my briefcase with my glasses and they are on my desk."
Exercise	"I park as far away in the parking lot as I can so it is a longer walk; to get a few extra minutes in."
Stress management	"The majority of my stress is at work. I go online for a few minutes to get my mind off the stress"
Fluid restriction	"I normally take (to work) how much water I have to drink for the day and that's what I keep in the bottle"

responsibilities. They negotiated accommodations directly such as work at home arrangements, flex time, or job modifications or indirectly through the development of support systems in the workplace. As a result, these participants described less conflict with self-care within the course of a workday.

Work–heart balance was not successful when heart failure symptoms placed individuals at risk for personal or job safety even with an accommodation. For these individuals, difficulties with memory, fatigue, and symptoms associated with exertion precluded them from working. Work–heart balance was also difficult when individuals were unable to develop strategies to practice self-care within the course of the workday. Social situations such as lunch with coworkers ("at work . . . on the road, there's cheese steaks . . . you don't have time to stop for a decent meal") or personal attitudes ("people here don't know I have heart failure . . . and it's not something I want people to know or I would not get work [as a consultant] . . .") often precluded self-care. These individuals were inconsistent in practicing self-care on a day-to-day basis.

Successfully balancing the responsibilities of employment with the priority of self-care enabled participants to navigate heart failure self-care and remain employed:

. . . once they (doctors) realized how important working was to me . . . we worked out a plan to work from home. Working at home . . . limits the hustle and bustle during a workday that can drain my energy. If I need to be in a meeting, there's teleconferencing. I don't have to deal with the commute . . . it defines the job much easier.

If I'm tired, I go lay down for a little bit, so I'm in control. I get some exercise in . . . sometimes it's during the work hours. At the end of the day, I still have energy to take care of myself which is important and the reason I am able to keep working. . . .

Quantitative Findings

Self-care scores were adequate overall (management mean = 71.28 ± 18.60; maintenance mean = 71.59 ± 14.25). However, individually, scores were low in a considerable proportion of the sample, defined by a standardized score of less than 70 on individual SCHFI scales. Only 43.9% of participants had adequate management scores and only 61% had adequate maintenance scores.

A significant difference ($p = .03$) in self-care maintenance scores between groups was found. Unemployed individuals reported better self-care maintenance (mean = 76.67 ± 14.17) than those who were working (mean = 66.25 ± 12.55). The mean management and maintenance scores in the unemployed group were adequate (score of 70 or more on the SCHFI scales). However, fewer employed individuals reported adequate self-care. Only 45% of those employed had adequate self-care maintenance compared to 76.2% of those unemployed ($p = .04$) (Table 3).

Cognition was also impaired in a significant proportion of the sample. Although differences in cognition were not statistically significant in this small sample, the unemployed participants had evidence of cognitive impairment, whereas most of the working group scored adequately on the cognitive tests. More than 14% of the

Table 3
Self-Care Practices by Employment Status

	<i>Employed (N = 20)</i>	<i>Unemployed (N = 21)</i>	<i>p</i>
Self-care management scale			
<i>M</i>	69.40	72.74	.57
<i>SD</i>	19.67	18.16	
Median	64.64	77.15	
Minimum	41.70	37.53	
Maximum	100	100	
Self-care maintenance scale			
<i>M</i>	66.25	76.67	.03*
<i>SD</i>	12.55	14.17	
Median	65	75	
Minimum	40	50	
Maximum	80	100	
Self-care confidence scale			
<i>M</i>	73.60	77.24	.38
<i>SD</i>	14.97	14.30	
Median	75.06	75	
Minimum	45.87	50.04	
Maximum	100	100	
Above cutoff score of 70			
Self-care management	42.9%	44.7%	.18
Self-care maintenance	45%	76.2%	.04*
Self-care management and maintenance	22.2%	52.6%	.06
Self-care confidence	55%	61.9%	.65

p < .05.

unemployed group had evidence of cognitive deficits on the Digit Symbol Substitution Test and 52.4% had impaired memory as measured by the Probed Memory Recall test. None of the employed participants had evidence of impairment on the Digit Symbol Substitution Test and only 40% had impaired memory on the Probed Memory Recall test.

Integrated Findings

The final step in the data analysis was to integrate the qualitative and quantitative data to gain additional insights about heart failure self-care within the context of employment. In this mixed methods study, there was 90% concordance between the qualitative and the quantitative analyses of self-care.

Most of those in this sample who were employed ($n = 16$) reported poorer self-care practices than those who were not employed. Some who continued to work but reported inadequate self-care did not experience symptoms that interfered with their ability to work. Rath-

er, they reported losing vigilance in self-care activities with the priorities of day-to-day work and family ("Right after, I was really focused . . . when I went back to work . . . the better [I] felt, the less I exercised. . . . I was very diligent with salt intake . . . the further you get away from the event . . . you tend to revert back to old habits . . ."). These individuals had higher scores on the cognition tests (Mann-Whitney, $p = .020$ to $.025$) and better physical functioning (Mann-Whitney, $p = .02$) than those who were unemployed with inadequate self-care. Unemployed individuals with cognitive impairment described their struggle to remember to take medications and poor concentration. They reported fatigue as the primary reason for inability to work, as explained by this comment from an unemployed participant who was cognitively impaired: "I didn't have the energy to work anymore, it was gone. I couldn't do it."

Only five individuals who were employed reported adequate self-care practices (SCHFI > 70). These individuals had experienced symptoms that, if left unmanaged,

would result in acute exacerbation of their heart failure. However, they described positive attitudes toward working, self-efficacy within the context of working, and heart failure self-care and strategies to make self-care practices fit into the daily routine of working:

I pack my lunch and I usually exercise at lunch by walking 3 miles. My coworkers walk with me. . . . Sometimes I do delay my Lasix® pill, but only by 2 hours if I have a morning conference meeting. . . . Managing my heart failure is extremely important, extremely important I want to be able to function as normally as possible and I want to be able to continue to work. I want to continue to work because of the financial rewards but also because I enjoy working . . . I just want to be with my family and friends.

In contrast, the unemployed individuals with adequate self-care practices at home were unable to balance work and self-care. Several described being caught in a Catch-22, as one recently unemployed individual explained: “. . . going to work took everything I had, getting up, going into work . . . on my feet all day . . . I was using a lot of sick time. With the disability . . . I will be okay (financially) and I can focus on taking care of myself.” For others, the physical requirements of the occupation (e.g., auto mechanic) posed health concerns that could not be accommodated.

DISCUSSION

In this study, self-care was poorer in the employed group than in the unemployed group, suggesting that as some individuals with heart failure return to work, self-care may become less of a priority. Furthermore, cognitive function in those employed was intact. These findings suggest that, for employed individuals, decision making about self-care was most likely influenced by attitudes and self-efficacy toward those practices. Although several of the employed participants described workplace accommodations that had been negotiated with their employers, many struggled with balancing self-care in the difficult work environment. Numerous resources describe potential accommodations for workers with disabilities (Phillips et al., 2005), yet the needs of workers with heart failure may not be intuitive to employees or employers. Disease management programs facilitated by nurses are a hallmark of heart failure management (Grady et al., 2000; Hamner, 2005); however, returning to work with heart failure is rarely considered part of the care plan (Phillips et al.). This study suggests that individuals who lack resources and support to prepare for return to work are at risk for lapses in self-care practices necessary to meet the demands of a workday.

Although little is known about heart failure self-care among employees, studies that have investigated employment among individuals with chronic disease have found a variety of perceived benefits of and motivating factors for returning to work similar to those found in this study, including returning to “normalcy” (Morales et al., 2000), work identity (Liedberg & Henriksson, 2002), supportive colleagues (Detaille, Haafkens, & van Dijk, 2003), and financial gains (Morales et al.). Conversely, barriers to

returning to work identified in this study and consistent with the literature include perceived risk of complications (Mittag, Kolenda, Nordmann, Bernien, & Maurischat, 2001), burden of self-care management in the workplace (Weijman et al., 2005), and work characteristics (Froom, Gofer, Boyko, & Goldbourt, 2002).

The current study's findings also support the existing literature on employment and chronic illness that identifies biobehavioral variables as well as illness characteristics and organizational features that affect an individual's ability to maintain employment. In this study, physical functioning and cognition were important variables in one's ability to return to work. For individuals with cognitive impairment and symptoms that required consistent self-care, employment was difficult. Those who were able to balance their heart failure self-care within the context of employment had developed strategies and often negotiated accommodations to incorporate the day-to-day activities of self-care into their daily work routines. These individuals reported favorable attitudes and self-efficacy toward heart failure self-care and employment, as well as intrinsic and extrinsic benefits gained from their efforts. This finding is supported by Petrie et al. (1996), who found that individuals' beliefs about their cardiac disease and recovery predicted their course of cardiac rehabilitation, including returning to work. In addition, a study of self-care management and employment among individuals with diabetes found a similar relationship among personal factors including self-efficacy, perceived burden, and self-care management (i.e., glucose monitoring and regulation) (Weijman et al., 2005).

This study has several limitations. Although the sample size of 41 was adequate for a qualitative study, there was limited power for quantitative analysis. The final sample was predominately White and male. These findings need to be confirmed in a larger sample of adults with heart failure including appropriate representation of women, African Americans, and Hispanics.

IMPLICATIONS FOR PRACTICE

Although self-care was poorer overall among employed individuals, the intrinsic and extrinsic rewards of employment were found to be beneficial. In addition, evidence from this exploratory work supports attitudes, self-efficacy, cognition, and physical functioning as influencing heart failure self-care in the workplace. Individuals' attitudes toward employment augmented their efforts to develop strategies for work–heart balance that included negotiating workplace accommodations with employers, provided physical functioning and cognition did not significantly interfere with the ability to perform jobs safely.

Occupational health nurses can assist workers with heart failure who are still part of the work force or who are planning to return to work in developing strategies to manage the complexities of their illness and minimize disability. Evidence-based research on accommodations for workers with heart failure is also needed to guide employers and health care providers in facilitating return to work.

Because a large proportion of individuals with heart

Work-Heart Balance

The Influence of Biobehavioral Variables on Self-Care Among Employees With Heart Failure

Dickson, V. V., McCauley, L. A., & Riegel, B.

AAOHN Journal 2008; 56(2), 63-73.

- 1 Occupational health nurses may support the day-to-day integration of self-care within the context of job duties by workers with heart failure. Specifically, occupational health nurses can reinforce self-care practices and knowledge (and, conversely, correct misconceptions) that build skills and self-efficacy.
- 2 Workplace accommodations are critical for many workers with heart failure. Occupational health nurses are uniquely qualified to assist workers and their health care providers in identifying potential job modifications, including securing a safe work environment, and work hardening programs that will support successful return to work.
- 3 Occupational health nurses should assess and monitor workers' risk factors, support clinical management through either primary care in the workplace or education and monitoring, and provide lifestyle counseling for unhealthy behaviors.

failure want to remain in the work force, assessing employment goals and return-to-work strategies should be part of disease management plans. This will likely necessitate education of health care providers (e.g., primary care providers, cardiologists, and heart failure physicians) and occupational health practitioners to foster a collaborative effort and support workers' employment capabilities.

CONCLUSION

Each year, 500,000 individuals are newly diagnosed with heart failure. Advances in technology continue to prolong survival rates. Therefore, because the heart failure population continues to increase and the American work force is aging, it is particularly important to improve self-care among those individuals with heart failure who are employed to optimize employment success.

This mixed methods study found that the biobehavioral variables of attitudes, self-efficacy, cognition, and physical functioning play a critical role in heart failure self-care within the context of employment. These results suggest important clinical and research implications for occupational health nurses. For those individuals with heart failure who are still a part of the work force or who are planning to return to work, strategies are needed to support their ability to manage the complexities of their

illness while remaining active and productive at work. Job flexibility, workplace accommodations, and coworker support should be explored as methods to promote self-care among patients who return to work. Occupational health nurses can play an essential role in facilitating employment among this group of workers.

This research was supported in part by funding from the NIOSH Education and Research Center for Occupational Safety and Health at the Johns Hopkins Bloomberg School of Public Health (#T42OH0087428-02), the 2006 American Association of Occupational Health Nurses, Inc. Otis Clapp New Investigator Award, and by the SIG-MA Theta Tau International Honor Society.

REFERENCES

- Ayres, L., Kavanaugh, K., & Knafl, K. (2003). Within-case and across-case approaches to qualitative data analysis. *Qualitative Health Research*, 13(6), 871-883.
- Bureau of Labor Statistics. (2005). *Glossary*. Retrieved October 15, 2005, from www.bls.gov
- Cohen, R., & Swerdlik, M. (2004). *Psychological testing and assessment: An introduction to tests and measurements* (6th ed.). Boston: McGraw Hill.
- Deaton, C., & Grady, K. (2004). State of the science for cardiovascular nursing outcomes: Heart failure. *Journal of Cardiovascular Nursing*, 19(5), 329-338.
- Detaille, S., Haafkens, J., & van Dijk, F. (2003). What employees with rheumatoid arthritis, diabetes mellitus and hearing loss need to cope at work. *Scandinavian Journal of Work, Environment, and Health*, 29(2), 134-142.
- Dinges, D., Kribbs, N., Bates, B., & Carlin, M. (1993). A very brief probed-recall memory task: Sensitivity to sleep loss. *Sleep Research*, 22, 330.
- Fried, L., Kronmal, R., Newman, A., Bild, D., Mittlemark, M., Polak, J., et al. (1998). Risk factors for 5-year mortality in older adults: The Cardiovascular Health Study. *Journal of the American Medical Association*, 279(8), 585-592.
- Froom, P., Gofer, D., Boyko, V., & Goldbourt, U. (2002). Risk for early ischemic event after acute myocardial infarction in working males. *International Journal of Occupational Medicine and Environmental Health*, 15(1), 43-48.
- Grady, K., Dracup, K., Kennedy, G., Moser, D., Piano, M., Stevenson, W., et al. (2000). Team management of patients with heart failure: A statement for healthcare professionals from The Cardiovascular Nursing Council of the American Heart Association. *Circulation*, 102(19), 2443-2456.
- Gregory, R. (1999). *Foundations of intellectual assessment: The WAIS-III and other tests in clinical practice*. Boston: Allyn and Bacon.
- Hamner, J. (2005). State of the science: Posthospitalization nursing interventions in congestive heart failure. *Advances in Nursing Science*, 28(2), 175-190.
- Hershberger, R., Hanyu, N., Nauman, D., Burgess, D., Toy, W., Wise, K., et al. (2001). Prospective evaluation of an outpatient heart failure management program. *Journal of Cardiac Failure*, 7(1), 64-74.
- Hlatky, M., Boineau, R., Higginbotham, M., Lee, K., Mark, D., Califf, R., et al. (1989). A brief self-administered questionnaire to determine functional capacity (the Duke Activity Status Index). *American Journal of Cardiology*, 64(10), 651-654.
- Jaarsma, T., Halfens, R., Tan, F., Abu-Saad, H., Dracup, K., & Diederiks, J. (2000). Self-care and quality of life in patients with advanced heart failure: The effect of a supportive educational intervention. *Heart & Lung: The Journal of Acute and Critical Care*, 29(5), 319-330.
- Kubo, S., Schulman, S., Starling, R., Jessup, M., Wentworth, D., & Burkhoff, D. (2004). Development and validation of a patient questionnaire to determine New York Heart Association classification. *Journal of Cardiac Failure*, 10(3), 228-235.
- Lemay, S., Bedard, M., Rouleau, I., & Tremblay, P. (2004). Practice effect and test-retest reliability of attentional and executive tests in

- middle-aged to elderly subjects. *The Clinical Neuropsychologist*, 18(2), 284-302.
- Lezak, M., Howieson, D., & Lorig, D. (2004). *Neuropsychological assessment* (4th ed.). New York: Oxford University Press.
- Liedberg, G., & Henriksson, C. (2002). Factors of importance for work disability in women with fibromyalgia: An interview study. *Arthritis and Rheumatism*, 47(3), 266-274.
- Maeland, J., & Havik, O. (1987). Psychological predictors for return to work after a myocardial infarction. *Journal of Psychosomatic Research*, 31(4), 471-481.
- Mittag, O., Kolenda, K., Nordmann, K., Bernien, J., & Maurischat, C. (2001). Return to work after myocardial infarction/coronary artery bypass grafting: Patients' and physicians' initial viewpoints and outcome 12 months later. *Social Science and Medicine*, 52(9), 1441-1450.
- Morales, D., Catanese, K., Helman, D., Williams, M., Weinberg, A., Goldstein, D., et al. (2000). Six-year experience of caring for forty-four patients with a left ventricular assist device at home: Safe, economical, necessary. *Journal of Thoracic and Cardiovascular Surgery*, 119(2), 251-259.
- Petrie, K., Weinman, J., Sharpe, N., & Buckley, J. (1996). Role of patients' view of their illness in predicting return to work and functioning after myocardial infarction: Longitudinal study. *British Medical Journal*, 312(7040), 1191-1194.
- Pfizer U.S. Pharmaceuticals. (2001). *The health status of the United States workforce*. Retrieved December 8, 2007, from www.pfizer.com/files/products/The_Health_Status_of_the_United_States_Workforce_2007.pdf
- Phillips, L., Harrison, T., & Houck, P. (2005). Return to work and persons with heart failure. *Heart and Lung: The Journal of Acute and Critical Care*, 34(2), 79-88.
- Reid, M., Clark, A., Murdoch, D., Morrison, C. C. S., & McMurray, J. (2006). Patients strategies for managing medication for chronic heart failure. *International Journal of Cardiology*, 109(1), 66-73.
- Riegel, B., Carlson, B., Moser, D., Sebern, M., Hicks, F., & Roland, V. (2004). Psychometric testing of the self-care of heart failure index. *Journal of Cardiac Failure*, 10(4), 350-360.
- Rosamond, W., Flegal, K., Friday, G., Furie, K., Go, A., Greenlund, K., et al. (2007). Heart disease and stroke statistics—2007 update: A report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation*, 115(5), e119-e122.
- Weijman, I., Ros, W., Rutten, G., Schaufeli, W., Schabracq, M., & Winubst, J. (2005). The role of work-related and personal factors in diabetes self-management. *Patient Education and Counseling*, 59(1), 87-96.

SHARE YOUR IDEAS WITH YOUR COLLEAGUES

AAOHN Journal is seeking articles on the following topics:

Workers' Compensation
Leadership/Management
Safety
Legal/Regulatory Issues

Health Promotion
Disease Management
Ergonomics
Case Management

Mentoring is available for new authors! If interested, call (800) 241-8014, ext. 118. See most issues of the *Journal* for detailed information on manuscript submission. All manuscripts are peer reviewed.

For information on how to submit your manuscript, visit:
www.aaohnjournal.com/journal-info-for-contributors-pdf.pdf.

Work–Heart Balance: The Influence of Biobehavioral Variables on Self-Care Among Employees With Heart Failure

This issue of the AAOHN JOURNAL contains a Continuing Nursing Education Module on "Work–Heart Balance: The Influence of Biobehavioral Variables on Self-Care Among Employees With Heart Failure." 1.1 contact hours of continuing nursing education credit will be awarded by AAOHN upon successful completion of the posttest and evaluation.

A certificate will be awarded and the scored test will be returned when the following requirements are met by the participant: (1) The completed answer sheet is received at AAOHN on or before January 31, 2009; (2) A score of 70% (7 correct answers) is achieved by the participant; (3) The answer sheet is accompanied by a \$10.00 online or \$15.00 processing fee. Expect up to 6 weeks for delivery of the certificate.

Upon completion of this lesson, the occupational health nurse will be able to:

1. Identify the impact of heart failure on workers and the work force.
2. Describe the importance of self-care among workers with heart failure.
3. Discuss the quantitative and qualitative findings of this research study.
4. Identify the clinical implications for occupational health nurses who care for workers with or at risk for heart failure.

AAOHN is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

AAOHN is additionally approved as a provider by the California Board of Registered Nursing (#CEP9283) and the Louisiana State Board of Nursing (#LSBN3).

Contact hour credits received for successful completion of the posttest and evaluation may be used for relicensure, certification, or re-certification.

Directions: Circle the letter of the best answer on the answer sheet provided. (Note: You may submit a photocopy for processing.)

1. Hypertension precedes the development of heart failure in 91% of cases and affects ___% of the work force.

- A. 5.4.
- B. 7.0.
- C. 12.0.
- D. 15.0.

2. The occupational health nurse considers the cornerstone of heart failure management to be:

- A. Return to work.
- B. Self-care.
- C. Self-efficacy.
- D. Physical functioning.

3. In this sample, what was the Cronbach alpha reliability for the Duke Activity Status Index?

- A. 0.55.
- B. 0.65.
- C. 0.75.
- D. 0.86.

4. In this sample, what was the median number of hours worked per week?

- A. 4.
- B. 20.
- C. 40.
- D. 80.

5. A comparison of demographic and illness characteristics of employed and unemployed individuals revealed a statistically significant difference ($p = .003$) in:

- A. Left ventricle ejection fraction.
- B. Age.

- C. Length of heart failure.
- D. Heart failure etiology.

6. Employed participants reported this *extrinsic* reward associated with employment status:

- A. Improved mood.
- B. Financial gain.
- C. Improved mental activity.
- D. Increased social interaction.

7. How many individuals reported that the burden of heart failure and its symptoms prevented them from returning to work?

- A. 4.
- B. 12.
- C. 18.
- D. 26.

8. What was the overarching theme describing managing heart failure self-care and employment?

- A. Making it fit.
- B. Job satisfaction.
- C. Ability to work.
- D. Work–heart balance.

9. A statistically significant finding ($p = .03$) was that unemployed individuals reported better _____ than those who were employed.

- A. Self-care management.
- B. Self-care maintenance.
- C. Cognition.
- D. Physical functioning.

10. In this study, ___ employed individuals reported adequate self-care practices.

- A. 5.
- B. 7.
- C. 9.
- D. 11.

Work-Heart Balance: The Influence of Biobehavioral Variables on Self-Care Among Employees With Heart Failure

February 2008

(Goal: To gain ideas and strategies to enhance personal and professional growth in occupational health nursing.)

Mark one answer only!

(You may submit a photocopy of the answer sheet for processing.)

- | | |
|------------|-------------|
| 1. A B C D | 6. A B C D |
| 2. A B C D | 7. A B C D |
| 3. A B C D | 8. A B C D |
| 4. A B C D | 9. A B C D |
| 5. A B C D | 10. A B C D |

EVALUATION (must be completed to obtain credit)

Please use the scale below to evaluate this continuing education module.

	4 - To a great extent	3 - To some extent	2 - To little extent	1 - To no extent
1. As a result of completing this module, I am able to:				
A. Identify the impact of heart failure on workers and the work force.	4	3	2	1
B. Describe the importance of self-care among workers with heart failure.	4	3	2	1
C. Discuss the quantitative and qualitative findings of this research study.	4	3	2	1
D. Identify the clinical implications for occupational health nurses who care for workers with or at risk for heart failure.	4	3	2	1
2. The objectives were relevant to the overall goal of this independent study module.	4	3	2	1
3. The teaching/learning resources were effective for the content.	4	3	2	1
4. How much time (in minutes) was required to read this module and take the test?	60	70	80	90

*Please print or type: (this information will be used to prepare your certificate of completion for the module).
DEADLINE: JANUARY 31, 2009. Allow up to 4 weeks for processing.*

NAME _____ MEMBERSHIP NUMBER _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____

LICENSE NUMBER _____

Processing Fees:

Online \$10.00, check or money order \$15.00 payable to AAOHN in U.S. Funds or bill my credit card: M/C Visa AMEX
 Mail to: Professional Practice — CE Module

AAOHN
 Ste. 100
 2920 Brandywine Rd.
 Atlanta, Georgia 30341

Cardholder's Name _____

Cardholder's Signature _____

_____ - _____ - _____ Expiration Date _____

**AN AUTHORIZED SIGNATURE IS REQUIRED FOR ALL CREDIT CARD ORDERS.
 CREDIT CARD ORDERS MAY BE FAXED TO (770) 455-7271.**