Self care behavior in patients with heart failure in Taiwan

Heng-Hsin Tung,1,2 Shu-Ching Chen,1 Wei-Hsian Yin,3 Ching-Hui Cheng,4 Tsae-Jyy Wang1 and Shu-Fang Wu1

Abstract
Objective: The aim of this study was to describe the self-care behaviors and associated demographic factors affecting such behaviors in the heart failure population in Taiwan.

Methods: A descriptive, cross-sectional, correlational design was used in this study and 86 heart failure patients were sampled by convenience sampling. Demographic questionnaire and Self-Care of Heart Failure Index, V. 6 were used to collect these data. Descriptive statistic, correlation coefficient and multiple regression were used to analyze the data.

Results: The result indicated a low level of self-care maintenance and management although self-care confidence was adequate. Patients who were married had better self-care maintenance and self-care confidence than those who were single. Self-care confidence was a determinant of self-care maintenance.

Conclusion: This study provided detailed information on self-care behavior status in heart failure patients in Taiwan.

Keywords
Heart failure, self care maintenance, self care management, self care confidence, self care behavior

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Introduction
Heart failure (HF) refers to a constellation of clinical symptoms (dyspnea and fatigue) and signs (edema and rales) that lead to frequent hospitalizations, poor quality of life, and a shortened life expectancy1 and is a common final stage of various heart diseases2,3. In Taiwan, 130,000 patients are admitted annually to the hospital due to HF, and the cost of hospital care for these patients is 1.97 billion (Euros)4. Previous researchers have shown that, for this population, health care costs, particularly for hospital care, were especially high. Notably, self-care was found to be associated with lower readmission rates, lower medical costs, and better outcomes5,6.

Self-care is defined as engaging in behaviors that promote health and limit illness7. The situation-specific theory of HF self-care posits that (a) self-care maintenance refers to behaviors such as medication adherence and symptom monitoring that are used to maintain physical stability and (b) self-care management refers to how patients respond when they have symptoms of HF. Patients need to learn how to recognize symptoms, evaluate them, implement treatment and then evaluate treatment. Notably, self-care confidence is not part of the self-care process, but it is an extremely important factor influencing the effectiveness of self-care8,9.

To determine the reasons for HF readmission, Annema, Luttik, and Jaarsma (2009) conducted a mixed-methods study, collecting data on 173 readmissions. The results indicated that nonadherence and nonoptimal medications were significant contributors to readmission and that 23% to 31% of readmissions might have been prevented if adherence were higher or if patients had asked for help earlier10. Another research group, using a descriptive,
cross-sectional design and a sample 400 HF patients, examined the relationship among demographics, illness characteristics, self-care ability, and health status. Researchers found that self-care ability had a direct positive impact on health status. The researchers concluded that promoting self-care ability could improve health status in patients with HF11. Investigators have documented that self-care is a foundation for preventing complications and achieving better outcomes in patients with HF12. As such, to provide good care for this population, nurses need to understand the patient's self-care status12. To provide a description of HF self-care abilities and difficulties that patients had in achieving success in self-care, Carlson, Riegel, and Moser (2001) conducted a descriptive, cross-sectional, comparative study with 139 HF patients13. The researchers revealed that patients' knowledge of signs and symptoms was poor, and, as such, recognition of changes in signs and symptoms was difficult for most patients. The researchers concluded that the self-care ability among the sample was considered low.

Moser and Watkins (2008) developed a conceptual model of factors affecting self-care decision-making in patients with HF. Factors included aging status, psychosocial status, current symptoms status, and previous experience14. Additionally, Dunbar (2008) found that, compared to patients who live with their families, patients who live alone and who are socially isolated are highly vulnerable to poor self-care15. In Taiwan, income, family support, and social support had a positive relationship with self-care16.

The literature portrays self-care behavior as a key component in early recognition of changes in symptoms, enabling the taking of appropriate action and the promoting of better outcome in HF patients. There is, however, very little research on this issue in Taiwan. Therefore, the purpose of this study is to describe the self-care behavior and associated demographic factors affecting such behavior in this population in Taiwan. The hypothesis for this study is that self-care confidence is positively associated with self-care maintenance and self-care management.

Method

A descriptive, cross-sectional, correlational design was used in this study of 86 HF patients, who were recruited by convenience sampling from three teaching hospitals in Taipei, Taiwan, from November 2009 to May 2010. The inclusion criteria were (a) HF for more than 6 months; (b) left ventricular ejection fraction of less than 50%; (c) diagnosis of New York Heart Association (NYHA) classes II and III; (d) 18 years of age or older; (e) able to speak and read Chinese; (f) no major surgery within a half-year; and (g) no comorbid life threatening illnesses such as cancer. Patients with psychiatric problems in server condition such as schizophrenia were excluded.

Approval of the institutional review boards of the three hospitals was obtained from the respective copyright holders. Potential patients were invited to participate in the doctor's ambulatory clinic, and participants who agreed to participate signed a consent form. The right of participants to withdraw from the study, as well as confidentiality, was presented. The participants completed the two questionnaires (demographic and self-care HF index) in a separate, quiet room in the clinic. An independent data collector, who was not involved in the care of the patient, assisted with the completion of the questionnaires by reading the questions as needed.

Instruments

Demographic questionnaire. The demographic questionnaire consisted of two sections. The first section was completed by the patient and included items on age, gender, religion, educational status, income, marital status, and family support. The second section was completed by the researchers and included information from the patient's record on comorbid condition, treatment plan, medications, and associated clinical data.

Self-Care of HF Index, V. 6 (SCHFI-V6). Self-care behavior was measured by an update version (V. 6) of the SCHFI. The SCHFI is a quantitative, ordinal, self-report questionnaire that uses a performance rating score derived from three subscales: self-care maintenance (10 items), self-care management (6 items), and self-care confidence (6 items). The developer of the instrument recommends scoring the three subscales individually instead of tabulating a total summary score.

Self-care management can be analyzed only if patients have been symptomatic in the past month. Self-care behavior is best represented by self-care maintenance and self-care management. Self-care confidence is an extremely important factor that moderates or mediates the relationship between self-care and outcomes9,17.

Each subscale was standardized to have a score range of 0 to 100. A score of 70 or greater on a subscale is considered adequate self-care9. The coefficient α for the three subscales was acceptable. Concurrent validity was confirmed by the correlation between SCHFI-V6 and the European HF Self-Care Behavior Scale. Confirmatory factor analysis was used to test construct validity, and the results confirmed that validity was adequate and similar to a previous version of the SCHFI9,17. A Chinese version of the SCHFI-V4 appeared to have adequate psychometric properties, but the SCHFI-V6 has not yet been used with a Chinese population18.

Psychometric properties of the instruments

Translation and back translation was performed by two bilingual experts. The content validity of the SCHFI-V6
was confirmed by an expert panel, which comprised one
doctorally prepared nursing faculty member, one cardiac
surgeon, one cardiologist, and one head nurse in a cardiac
intensive care unit. Experts rated most of items as culturally
relevant and contextually appropriate for measuring self-
care with .89 of average CVI (content validity index) score.
The alpha coefficient for internal consistency in this sample
was .635 for self-care maintenance, .716 for self-care man-
agement, and .860 for self-care confidence (Table 1).

### Data analysis

Descriptive statistics were used for the demographic data
and for self-care behavior. One-way analyses of variance
(ANOVAs), independent t tests, and Pearson correlations
were used to assess the effect of the demographic variables
on self-care behavior. General linear regression was used to
analyze the relationship between the independent and
dependent variables as well as to determine the degree of
variance in self-care maintenance and self-care manage-
ment that was explained by related factors. The significance
level was set at .05, and SPSS (Version 17.0 for Windows,
Chicago, IL) was used for all analysis.

### Results

#### Demographics

The demographics data of subjects are presented in Table 2.
Women represented 27% of the group, and the majority of
patients (87.2%) were over 50 years old (mean age = 65.73).
Most patients (67.4%) were married, and 74.4% were taken
care of by themselves or their family. The mean time since
a diagnosis of HF was 4.7 years, and 75.6% of the patients
had more than three cardiovascular-related risk factors.

#### Descriptive statistics for self-care behavior

Table 3 presents the data for self-care behavior in the HF
patients. The scores for self-care maintenance (mean =
53.95 ± 19.10) and self-care management (mean = 53.37 ±
25.81) were below 70, indicating a low level of self-care
maintenance and management. The mean self-care confi-
dence score was adequate, at 85.87.

In regard to self-care maintenance behavior, at least half
of the patients never or rarely weighed themselves (50%) or
checked their ankle swelling (62.8%). Moreover, 77.3% of
the patients did not ask for low-salt items when eating out
or visiting others.

In regard to self-care management behavior, 43 patients
(50%) recognized difficult breathing or ankle swelling.
Among these 43 patients, approximately one-third did not
reduce their salt intake (26.1%), did not reduce their fluid
intake (29.1%), or did not take an extra water pill (38.4%) to
deal with their symptoms. In addition, 77.4% did not use any
type of remedy the last time they were having trouble breath-
ning or had swelling of the ankles. Although the scores for self-
care maintenance and self-care management were low, the
overall score for self-care confidence was adequate (Table 3).

#### Correlations between the three subscales

Pearson correlations were used to examine the relationship
between the three subscales. As presented in Table 5, self-
care maintenance was positively correlated with self-care
management (r = .360, p = .018) and self-care confidence
(r = .304, p = .004).

#### Predictors of self-care maintenance

As noted above, based on Riegel and Dickson’s (2008) sit-
uation-specific theory of HF self-care, self-care behavior is
best represented by self-care maintenance and self-care
management. Self-care confidence was identified as an
important contributor to self-care behavior. A linear regres-
sion analysis, using a hierarchical method, was employed
to examine the predictors of self-care maintenance and self-
care management.

As seen in Table 6, 9.4% of the variability of self-care
maintenance was accounted for by self-care confidence
(β = .307, p = .004), and 4.5% of the variability was
accounted for by marital status (β = .220, p = .040). These
two variables accounted for 13.9% of the variability in self-
care maintenance. No factors were significantly related.

### Discussion

The aim of this study was to describe the self-care behav-iors and associated demographic factors affecting such
behaviors in the HF population in Taiwan. The results

| Table 1. Cronbach's α for the SCHFI |
|-----------------|-----------------|
| Scale           | Cronbach's α    |
| Self care maint  | .635            |
| Self care manage| .716            |
| Self care confi  | .860            |
self-care confidence was adequate. Self-care confidence and marital status were predictors of self-care maintenance. Participants who were married, as compared to those who were single, had better self-care maintenance. Previous research has found that good family functioning is highly related to self-care\(^{15,19}\). Liu et al. (2008) used a cross-sectional correlation design, with 77 Taiwanese patients, to investigate self-care ability and its related factors. Liu et al.’s results support those of the current study, that family support is positively correlated with self-care ability\(^{16}\). Therefore, health care providers should offer relevant education to the HF patients themselves and their family members. Specifically, clinicians shall provide emotional support to patients who are single and live alone.

Regarding self-care maintenance in the current study, the lowest level of self-care maintenance concerned asking for a low-salt diet when eating out, checking one’s ankles for swelling, and weighing oneself. The lowest level of

**Table 2.** Demographic variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>63</td>
<td>73.0</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>27.0</td>
</tr>
<tr>
<td>Age (Mean: 65.73 ± SD: 12.56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50</td>
<td>11</td>
<td>12.8</td>
</tr>
<tr>
<td>50–60</td>
<td>16</td>
<td>18.6</td>
</tr>
<tr>
<td>60</td>
<td>59</td>
<td>68.6</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>40</td>
<td>46.5</td>
</tr>
<tr>
<td>Over weight</td>
<td>44</td>
<td>51.2</td>
</tr>
<tr>
<td>Underweight</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>Employee status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>23</td>
<td>26.7</td>
</tr>
<tr>
<td>No</td>
<td>63</td>
<td>73.3</td>
</tr>
<tr>
<td>Education</td>
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<td></td>
</tr>
<tr>
<td>Elementary or below</td>
<td>38</td>
<td>45.2</td>
</tr>
<tr>
<td>High school</td>
<td>27</td>
<td>31.4</td>
</tr>
<tr>
<td>A.A. or above</td>
<td>21</td>
<td>24.4</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single/divorced/widowed</td>
<td>28</td>
<td>32.6</td>
</tr>
<tr>
<td>Married</td>
<td>58</td>
<td>67.4</td>
</tr>
<tr>
<td>Religion</td>
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<td></td>
</tr>
<tr>
<td>No religion</td>
<td>23</td>
<td>26.7</td>
</tr>
<tr>
<td>Buddhism/Daoism</td>
<td>59</td>
<td>68.6</td>
</tr>
<tr>
<td>Christianity/Catholicism</td>
<td>4</td>
<td>4.6</td>
</tr>
<tr>
<td>Economic Resource</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>42</td>
<td>48.8</td>
</tr>
<tr>
<td>Family</td>
<td>22</td>
<td>25.6</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>25.6</td>
</tr>
<tr>
<td>Care provider</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>74</td>
<td>86.0</td>
</tr>
<tr>
<td>Family</td>
<td>8</td>
<td>9.3</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Meal preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self or family</td>
<td>66</td>
<td>76.7</td>
</tr>
<tr>
<td>Eat out or other</td>
<td>20</td>
<td>23.3</td>
</tr>
<tr>
<td>Time since diagnosed (Mean: 4.7 ± SD: 3.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>57</td>
<td>66.3</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>21</td>
<td>24.4</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>8</td>
<td>9.3</td>
</tr>
<tr>
<td>Cardiovascular high risk factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>59</td>
<td>86.6</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>39</td>
<td>45.3</td>
</tr>
<tr>
<td>Renal disease</td>
<td>14</td>
<td>16.3</td>
</tr>
<tr>
<td>Liver disease</td>
<td>9</td>
<td>10.5</td>
</tr>
<tr>
<td>Hypercholesterism</td>
<td>49</td>
<td>60.0</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>1</td>
<td>0.12</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>31</td>
<td>3.6</td>
</tr>
<tr>
<td>History of Myocardial Infarction</td>
<td>10</td>
<td>11.6</td>
</tr>
<tr>
<td>Risk factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 3</td>
<td>65</td>
<td>75.6</td>
</tr>
<tr>
<td>More than 3</td>
<td>21</td>
<td>21.4</td>
</tr>
</tbody>
</table>

**Table 2.** (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischemic</td>
<td>48</td>
<td>55.8</td>
</tr>
<tr>
<td>Non-ischemic</td>
<td>38</td>
<td>44.1</td>
</tr>
<tr>
<td>LVEF (Mean: 36.0 ± SD: 3.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up 45%</td>
<td>73</td>
<td>84.9</td>
</tr>
<tr>
<td>Over 45%</td>
<td>13</td>
<td>15.1</td>
</tr>
<tr>
<td>NYHA classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>65</td>
<td>75.6</td>
</tr>
<tr>
<td>III</td>
<td>21</td>
<td>24.4</td>
</tr>
</tbody>
</table>

LVEF = Left Ventricular Ejection Fraction.

It found a low level of self-care maintenance and management although self-care confidence was adequate. Self care confidence and marital status were predictors of self-care maintenance.

Participants who were married, as compared to those who were single, had better self-care maintenance. Previous research has found that good family functioning is highly related to self-care\(^{15,19}\). Liu et al. (2008) used a cross-sectional correlation design, with 77 Taiwanese patients, to investigate self-care ability and its related factors. Liu et al.’s results support those of the current study, that family support is positively correlated with self-care ability\(^{16}\). Therefore, health care providers should offer relevant education to the HF patients themselves and their family members. Specifically, clinicians shall provide emotional support to patients who are single and live alone.

The adequacy of self-care behavior was represented by self-care maintenance and self-care management, and the mean scores for these two subscales were below 70. Additionally, only 20.9% of this sample had an adequate score for self-care maintenance, and only 34.9% had an adequate score for self-care management. Cameron et al. (2009) also found that both self-care maintenance and self-care management were below 70, with 52% of patients adequate in self-care maintenance and only 12% adequate in self-care management\(^{17}\). Interestingly, although low scores for self-care maintenance and self-care management were seen in the present study, the majority of patients (70.9%) obtained adequate scores (over 70) for self-care confidence. This might indicate that improving one's self-care confidence alone might not affect actual self-care behavior. Notably, self-care behavior is considered poor in patients with HF, and, thus, promoting self-care behavior through a designated intervention such as a nursing education is warranted for this population\(^{20}\).

Regarding self-care maintenance in the current study, the lowest level of self-care maintenance concerned asking for a low-salt diet when eating out, checking one's ankles for swelling, and weighing oneself. The lowest level of
Table 3. Descriptive statistics for self care behavior.

<table>
<thead>
<tr>
<th>Items</th>
<th>No. (%) or Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self care maintenance (n = 86)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Weight yourself</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>53.95 ± 19.10</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>&lt; 70 (n = 68; 79.0%)</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>&gt; 70 (n = 18; 20.9%)</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td></td>
</tr>
<tr>
<td>2. Check your ankles for swelling</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>62.8%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>8.1%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>7.0%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>22.1%</td>
</tr>
<tr>
<td>3. Try to avoid getting sick (e.g., flu shot)</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>24.4%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>9.3%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>11.6%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>54.7%</td>
</tr>
<tr>
<td>4. Do some physical activity</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>29.1%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>11.6%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>8.1%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>51.2%</td>
</tr>
<tr>
<td>5. Keep your doctor or nurse appointment</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>3.5%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>4.7%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>2.3%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>89.5%</td>
</tr>
<tr>
<td>6. Eat a low salt diet</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>19.8%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>12.8%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>8.1%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>59.7%</td>
</tr>
<tr>
<td>7. Exercise 30 minus</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>29.1%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>11.6%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>8.1%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>51.2%</td>
</tr>
<tr>
<td>8. Forget to take one of your medicine</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>64.0%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>5.8%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>22.1%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>8.1%</td>
</tr>
<tr>
<td>9. Ask for low salt item when eating out or visiting others</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>73.3%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>4.7%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>3.5%</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>18.6%</td>
</tr>
<tr>
<td>(continued)</td>
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</tr>
</tbody>
</table>

Table 3. (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>No. (%) or Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Use a system to help you remember to take your pills</td>
<td></td>
</tr>
<tr>
<td>(1) Never/rarely</td>
<td>16.3%</td>
</tr>
<tr>
<td>(2) Sometimes</td>
<td>2.3%</td>
</tr>
<tr>
<td>(3) Frequently</td>
<td>3.5</td>
</tr>
<tr>
<td>(4) Always or daily</td>
<td>77.9%</td>
</tr>
<tr>
<td>11. If you had trouble breathing or ankle swelling in the past month.</td>
<td></td>
</tr>
<tr>
<td>How quickly did you recognize it as a symptom of heart failure</td>
<td></td>
</tr>
<tr>
<td>*I did not recognize it</td>
<td>51.2%</td>
</tr>
<tr>
<td>(1) not quickly</td>
<td>2.3%</td>
</tr>
<tr>
<td>(2) Somewhat quickly</td>
<td>8.1%</td>
</tr>
<tr>
<td>(3) Quickly</td>
<td>4.7%</td>
</tr>
<tr>
<td>(4) Very quickly</td>
<td>33.7%</td>
</tr>
<tr>
<td>12. Reduce the salt in your diet</td>
<td></td>
</tr>
<tr>
<td>(1) Not likely</td>
<td>26.7%</td>
</tr>
<tr>
<td>(2) Somewhat likely</td>
<td>4.7%</td>
</tr>
<tr>
<td>(3) Likely</td>
<td>1.2%</td>
</tr>
<tr>
<td>(4) Very likely</td>
<td>17.4%</td>
</tr>
<tr>
<td>13. Reduce fluid intake</td>
<td></td>
</tr>
<tr>
<td>(1) Not likely</td>
<td>29.1%</td>
</tr>
<tr>
<td>(2) Somewhat likely</td>
<td>3.5%</td>
</tr>
<tr>
<td>(3) Likely</td>
<td>1.2%</td>
</tr>
<tr>
<td>(4) Very likely</td>
<td>16.3%</td>
</tr>
<tr>
<td>14. Take an extra water pill</td>
<td></td>
</tr>
<tr>
<td>(1) Not likely</td>
<td>38.4%</td>
</tr>
<tr>
<td>(2) Somewhat likely</td>
<td>0.0%</td>
</tr>
<tr>
<td>(3) Likely</td>
<td>1.2%</td>
</tr>
<tr>
<td>(4) Very likely</td>
<td>10.5%</td>
</tr>
<tr>
<td>15. Call your doctor or nurse for guidance</td>
<td></td>
</tr>
<tr>
<td>(1) Not likely</td>
<td>3.5%</td>
</tr>
<tr>
<td>(2) Somewhat likely</td>
<td>2.3%</td>
</tr>
<tr>
<td>(3) Likely</td>
<td>1.2%</td>
</tr>
<tr>
<td>(4) Very likely</td>
<td>43.0%</td>
</tr>
<tr>
<td>16. Think of a remedy you try last time you had trouble breathing or ankle swelling</td>
<td></td>
</tr>
<tr>
<td>How sure were you that remedy helped or did not help</td>
<td></td>
</tr>
<tr>
<td>*I did not try</td>
<td>74.4%</td>
</tr>
<tr>
<td>(1) Not sure</td>
<td>3.5%</td>
</tr>
<tr>
<td>(2) Somewhat sure</td>
<td>1.2%</td>
</tr>
<tr>
<td>(3) Sure</td>
<td>4.7%</td>
</tr>
<tr>
<td>(4) Very sure</td>
<td>16.3%</td>
</tr>
<tr>
<td>17. Self care confidence (n = 86)</td>
<td></td>
</tr>
<tr>
<td>&lt; 70 (n = 25; 29.1%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 70 (n = 61; 70.9%)</td>
<td></td>
</tr>
</tbody>
</table>
self-care management involved how sure the patient was in regard to whether the remedy was helpful, taking an extra water pill, and reducing fluid intake. Liu et al. (2008) also reported that controlling new symptoms, weighing oneself, and reducing fluid intake were major concerns. This information shows the importance of health care providers teaching patients to recognize their symptoms and to take action to deal with them.

In this study, self-care confidence was a predictor of self-care maintenance. This result indicates that self-care confidence is a highly relevant factor to self-care, in keeping with Riegel and Dickson's (2008) situation-specific theory of HF self-care. Self-care confidence, however, was not associated with self-care management, a finding that does not fit with Riegel and Dickson's theory. This finding implies that an increase in self-care confidence alone might not work in enhancing self-care management. Additionally, marital status is another predictor of self-care maintenance, a finding that supports that of previous research.

Concerning the demographic in this study, the majority of the patients were male and over 60 years old, which is similar to the patients in previous research conducted in Taiwan and in the West. Most participants were retired, and hence not employed, again similar to the findings of Western research.

Riegel et al. (2010) used a cross-sectional mixed method to assess whether aging is associated with less ability to detect physiological information in HF patients. The results from integrated quantitative and qualitative data revealed that older patients had more difficulty in recognizing and interpreting shortness of breath although older patients were twice likely as younger to report a different level of this symptom. In addition, Siu et al. (2008) recruited 571 patients to the association of education and outcomes in chronic HF. The results indicated that lower education was associated with increased hospitalizations among ambulatory chronic HF patients. Educational level might be associated with learning ability and the ability to recognize changes in their symptoms. In our study, 68.6% of the samples were over 60 years old and 45.2% of them had an elementary school education or less, and, as such, these patients might have a low ability to learn, which could influence their self-care behavior.

Wal van der et al. (2007) recruited 954 HF patients, of which 39% had HF due to coronary artery disease. The results of Wal van der et al.'s study indicated that 55.4% of the participants experienced HF due to coronary artery disease. In addition, Kato et al. (2009) studied a sample of 116 patients with HF in Japan and found that diabetes mellitus was an independent predictor of poor adherence to self-care behavior. In our study, 45.3% of the participants had diabetes mellitus, and over half were overweight and had hypertension. These are considered the risk factors for heart problems. Thus, how to help patients to control their weight, hypertension, diabetes, and existing comorbidities is very important.

**Limitations**

Since patients all had mild to moderate symptoms (NYHA Classes II and III), results of this study cannot be generalized to the entire HF population. Data were collected from three different hospitals, which was another limitation of the study. Specifically, different hospitals have different environments, and patient education by nurses may have been inconsistent between hospitals. Small sample size and heavy male enrollment is another limitation. Additionally, because a cross-sectional design was used in this study, we do not have an understanding of the changes in self-care behavior over time.

**Recommendations**

Future study investigating self-care behavior and its related factors should be conducted with a larger sample and...
should include psychosocial factors such as mental status and social support. Longitudinal study is needed to understand the self-care behavior at the time that HF was diagnosed as well as changes in behavior over time. Collecting qualitative data by interviewing patients might contribute to our understanding of quantitative results. In addition, the family has been documented as a highly relevant factor in self-care behavior. The function and structure of the family and the burden of the caregiver should be examined in future research as a means to promote better outcomes for HF patients. Finally, educational interventions have been shown to be an effective method to improve HF self-care behavior early after discharge (Jaarsma et al., 2000). To enhance self-care behavior in this population, future research should use an experimental (intervention) design.

Conclusion

This study provided detailed information on self-care behavior status in HF patients as well as provided evidence of overall poor self-care maintenance and self-care management in patients with HF in Taiwan. The relationship among demographic factors, self-care confidence, and self-care behavior was discussed. According to the study results, the health care disciplines should focus on the patients who were not married. In addition, the clinicians can design education intervention on topics about the importance of measure daily weight and low salt diet use as well as medications use. Multidisciplinary team shall use this information to design a designated intervention to educate and motivate HF patients to become active participants in their care.

Acknowledgements

We would like to express our sincere appreciation of the participants in Cheng-Hsin hospital, Wang-Fang Hospital and Tsu-Chi Hospital in Taipei Taiwan for their willingness to share their experiences with us.

References


3. Searon, F. Meeting the information needs of patients with chronic HF. *Nurs Stand* 2007; 22(14–16): 52–57.