



Original article

Validation of the Symptom Status Questionnaire-Heart Failure in Korean patients^{☆, ☆☆}



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ABSTRACT

Aim: The purpose of this study was to examine the psychometric properties of the Korean version of the Symptom Status Questionnaire-Heart Failure (SSQ-HF) in patients with heart failure (HF). Specific aims were to examine 1) reliability and item homogeneity, using Cronbach's alpha and item analyses; and 2) validity, using factor analysis and known relationships of depressive symptoms and perceived control to HF symptoms.

Background: HF symptoms are among the strongest factors affecting health-related quality of life (HRQOL), and can lead to hospitalization. Therefore, it is important to assess and manage HF symptoms using a reliable and valid instrument. However, there is no such instrument for Korean patients with HF.

Methods: Data on HF symptoms, sociodemographic and clinical characteristics, and covariates such as depressive symptoms, perceived control, and self-care maintenance were collected from 119 patients (mean age: 65.0 years; 58.8% males). Cronbach's alpha was used to test reliability, and factor analysis and multiple regression analyses were used to test validity.

Results: Cronbach's alpha was 0.76, supporting reliability. In factor analysis, a single-factor structure emerged, and the loading coefficients of all items were > 0.45, supporting construct validity. In addition, as hypothesized, depressive symptoms and perceived control were significantly associated with HF symptoms, further supporting validity.

Conclusions: The reliability and validity of the Korean version of the SSQ-HF were supported among Korean HF patients. Clinicians and researchers can use the SSQ-HF to assess and manage common HF symptoms.

1. Introduction

The majority of patients with heart failure (HF) experience HF-related physical symptoms, such as dyspnea, fatigue, dizziness, chest pain, edema, and sleeping difficulties (Albert, Trochelman, Li, & Lin, 2010; Fan & Meng, 2015). HF symptoms lead to poor health-related quality of life (HRQOL) and high rates of hospitalization (Giamouzis et al., 2011; Heo et al., 2015). HRQOL is poorer in patients with HF than in their age-matched healthy counterparts (Lesman-Leegte et al., 2009), and HF symptoms are the strongest factor associated with poor HRQOL (Heo et al., 2015). Approximately half of HF patients are readmitted to hospitals within 6 months after discharge (Giamouzis et al., 2011), and approximately 75% of them exhibit worsening of HF symptoms (Giamouzis et al., 2011). Thus, it is critical to assess and manage common HF symptoms using a reliable and valid instrument.

In patients with HF, symptoms have been assessed using several instruments, including the Symptom and Symptom Stability subscales of the Kansas City Cardiomyopathy Questionnaire (KCCQ) (Green, Porter, Bresnahan, & Spertus, 2000), the Dyspnea-Fatigue Index (Feinstein, Fisher, & Pigeon, 1989), the Memorial Symptom Assessment Scale (MSAS) (Blinderman, Homel, Billings, Portenoy, & Tennstedt, 2008), the MSAS-Short Form (Bekelman et al., 2007), the MSAS-HF (Zambroski, Moser, Bhat, & Ziegler, 2005), and the Heart Failure Somatic Perception Scale (HFSPS) (Altice & Madigan, 2012; Jurgens, Fain, & Riegel, 2006). However, these instruments have some limitations in assessing HF symptoms and examining their unique effects on patient outcomes. Some of the instruments assess only a few HF symptoms (Feinstein et al., 1989; Green et al., 2000), and some assess HF symptoms as well as functional status (Feinstein et al., 1989), psychological symptoms (Browall, Kenne Sarenmalm, Nasic,

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Wengstrom, & Gaston-Johansson, 2013; Portenoy et al., 1994; Zambroski et al., 2005), or the effects of symptoms on daily activities (Altice & Madigan, 2012), which are part of quality of life. Thus, it is difficult to use these instruments to assess common HF symptoms and their unique effects on patient outcomes.

In order to address the limitations of the existing instruments, the Symptom Status Questionnaire-Heart Failure (SSQ-HF) has been developed to assess the presence, frequency, severity, and distress of 7 common HF symptoms: dyspnea during day time and when lying down, fatigue, edema, chest pain, sleeping difficulties, and dizziness (Heo et al., 2015). Patients can fill it out within 5 min, and clinicians can check the symptoms within 3 min. The reliability and validity of the SSQ-HF have been supported in American patients with New York Heart Association (NYHA) functional class II to IV HF (Heo et al., 2015).

The incidence of HF is higher in South Korea (12.4 per 1000 adult population) (Lee, SH, Cho, Cho, & Kang, 2016) than in the United States (10 per 1000 older adult population) (Mozaffarian et al., 2016). In South Korea, the majority of HF patients also have common HF symptoms, such as dyspnea, fatigue, sleeping difficulties, and edema (Song, Moser, Rayens, & Lennie, 2010). HF symptoms are among the strongest factors affecting poor functional status (Song, Moser, & Lennie, 2009), and can lead to high rates of cardiac re-hospitalization and mortality in Korean patients with HF (Song et al., 2010). Whereas this evidence makes it clear that HF symptoms must be assessed and managed among Korean HF patients using a reliable and valid instrument, there is no such instrument in the Korean language. Therefore, we tested the psychometric properties of the Korean version of the SSQ-HF among Korean patients with HF, and assessed its reliability and item homogeneity using Cronbach's alpha and item analyses. We tested validity using factor analysis and known relationships. We hypothesized that more severe depressive symptoms and low levels of perceived control would be associated with more severe HF symptoms (Heo et al., 2014; Heo et al., 2015; Heo, Doering, Widener, & Moser, 2008), controlling for age (Heo et al., 2008; Meyer et al., 2016), gender (Heo, McSweeney, Tsai, & Ounpraseuth, 2016; Meyer et al., 2016), education, body mass index (BMI) (Heo et al., 2015), comorbidities (Heo et al., 2015), medication (angiotensin-converting enzyme inhibitors [ACEIs], angiotensin II receptor blockers [ARBs], beta-blockers, and diuretics) (Meyer et al., 2016; Pang et al., 2014), and self-care maintenance (Heo et al., 2014).

2. Methods

2.1. Study design, setting, and sample

This was a descriptive correlational study using secondary data analysis. We used the baseline data from a parent study that evaluated the neuropsychological functioning of Korean patients with HF (Shin et al., 2017). Patients with HF were recruited from 3 university-affiliated medical centers. Patients who met the following inclusion criteria were enrolled: 1) confirmed diagnosis of HF with impaired systolic function according to LVEF (left ventricular ejection fraction; males: < 52%, females: < 54%), 2) aged 21 years or older, and 3) capability to understand and follow the study procedures. Patients who had any of the following criteria were excluded: 1) severe cognitive impairment or psychiatric problems as determined by referring physicians or through medical record review, 2) fatal comorbidities (e.g., terminal cancer), and 3) inability to read, see, or hear study materials.

The sample size for the current study was calculated based on that of a prior study that examined factors associated with HF symptoms (Heo et al., 2015). In that study, age, gender, comorbidities, BMI, medication, and depressive symptoms explained 35.5% of the variance in HF symptoms. Considering a 5% significance level, 80% power, 11 predictor variables, and a medium effect size, the sample size was 123 (G^*Power 3.1.5) (Faul, Erdfelder, Buchner, & Lang, 2009). One-hundred twenty patients with HF were enrolled, and data from 119 patients

were used in the current study. Data from one patient were excluded due to missing information.

2.2. Procedures

Approvals for this study were obtained from the relevant institutional review boards. Patients were recruited from inpatient units and outpatient clinics of 3 medical centers by referral from health care providers. Written informed consent was obtained from all participants before baseline data collection. Three graduate nursing students and a research coordinator collected data on HF symptoms, depressive symptoms, perceived control, self-care maintenance, and demographic and clinical characteristics.

2.3. Measures

Symptoms of HF were assessed using the Korean version of the SSQ-HF. The SSQ-HF was translated from English to Korean, then back-translated from Korean to English by two independent HF experts who could speak both languages fluently. Four HF experts reviewed both versions to compare the content, and did not find differences between them. The Korean version of the SSQ-HF, like the original version (Heo et al., 2015), consists of 28 items, which combined into 7 items assessing the presence, frequency, severity, and distress of 7 common HF symptoms: dyspnea during day time, dyspnea when lying down, fatigue, chest pain, edema, sleeping difficulties, and dizziness or loss of balance. A zero score is given if a symptom does not present. If a symptom is present, the patient is asked to indicate the frequency (1, *less than once per week* to 4, *nearly daily*), severity (1, *slight* to 4, *very much*), and distress (0, *not at all* to 4, *very much*) of the symptom. The total score for each symptom is calculated by summing the ratings for the frequency, severity, and distress of the symptom. The total score on the instrument is calculated by summing the total scores of the 7 symptoms. Possible total scores range from 0 to 84, with higher scores indicating more severe HF symptoms (Heo et al., 2015).

Depressive symptoms were assessed using the Patient Health Questionnaire (PHQ)-9 (Kroenke, Spitzer, & Williams, 2001). Total scores on the questionnaire range from 0 to 27, with higher scores indicating more severe depressive symptoms. A cut-off point of 10 is commonly used to divide those with or without depressive symptoms (Hammash et al., 2013). Its reliability and validity have been supported in patients with HF (Hammash et al., 2013). In the current study, Cronbach's alpha for the questionnaire was 0.86.

Perceived control was assessed using the Control Attitudes Scale-Revised (Moser et al., 2009). Possible scores on the scale range from 8 (*no perceived control*) to 40 (*highest level of perceived control*), with higher scores indicating better perceived control. Its reliability and validity have been supported in patients with HF (Moser et al., 2009). In the current study, Cronbach's alpha for the scale was 0.79.

Self-care maintenance was assessed using the maintenance subscale of the Self-Care of Heart Failure Index (SCHFI) Version 6.2 (Riegel et al., 2004; Riegel, Lee, Dickson, & Carlson, 2009). The instrument's total score is transformed to a score ranging from 0 to 100, with higher scores indicating greater self-care (Riegel et al., 2009). Scores of ≥ 70 indicate adequate self-care maintenance (Riegel et al., 2009). The validity and reliability of this instrument have been supported (Riegel et al., 2009), and in the current study, its Cronbach's alpha was 0.67.

Data on sociodemographic characteristics (age, gender, marital status, education, and BMI) and clinical characteristics (comorbidities, LVEF, NYHA functional class, medication, and HF etiology) were collected by sociodemographic or clinical questionnaire, patient interview, or medical record review. LVEF was assessed using standard 2D and Doppler echocardiography (Nagueh et al., 2009).

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