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Identification of symptom clusters among patients with heart failure: An international observational study

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ABSTRACT

Background: Virtually all patients with heart failure experience multiple symptoms simultaneously, yet clinicians and researchers usually consider symptoms in isolation. Recognizing and responding early to escalating symptoms is essential to preventing hospitalizations in heart failure, yet patients have considerable difficulty recognizing symptoms. Identification of symptom clusters could improve symptom recognition, but cultural differences may be present that must be considered.
Objectives: To identify and compare symptom clusters in heart failure patients from the United States, Europe and Asia.
Design: Cross-sectional, observational study.
Settings: In- and out-patient settings in three regions of the world: Asia (i.e., China and Taiwan); Europe (i.e., the Netherlands and Sweden); and the United States.
Participants: A total of 720 patients with confirmed heart failure. Propensity scoring using New York Heart Association Classification was used to match participants from each of the three regions.
Methods: Symptoms were identified using the Minnesota Living with Heart Failure Questionnaire. To identify symptom clusters we used cluster analysis with the hierarchical cluster agglomerative approach. We used the Euclidean distance to measure the similarity of variables. Proximity between groups of variables was measured using Ward's method. The resulting clusters were displayed with dendrograms, which show the proximity of variables to each other on the basis of semi-partial R-squared scores.
Results: There was a core group of symptoms that formed two comparable clusters across the countries. Dyspnea, difficulty in walking or climbing, fatigue/increased need to rest, and fatigue/low energy were grouped into a cluster, which was labeled as a physical capacity symptom cluster. Worrying, feeling depressed, and cognitive problems were grouped into a cluster, which was labeled as an emotional/cognitive symptom cluster. The

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symptoms of edema and trouble sleeping were variable among the countries and fell into different clusters.
Conclusion: Despite the diversity in cultures studied, we found that symptoms clustered similarly among the cultural groups. Identification of similar symptoms clusters among patients with heart failure may improve symptom recognition in both patients and healthcare providers.

What is already known about the topic?

- All heart failure patients have symptoms.
- Escalating symptoms, that are often not recognized, result in the frequent hospitalizations common in this population.
- Although symptoms occur simultaneously in most patients, researchers and clinicians focus on individual symptoms.

What this paper adds

- The findings from this study show that heart failure symptoms occur in identifiable clusters and we suggest that provision of this information to patients and healthcare providers may improve symptom recognition and appropriate action
- The data demonstrate that there are similar symptom clusters across of variety of cultures in the United States, Europe and Asia.
- The data from this study show that the clusters found were a physical capacity symptom cluster that consisted of dyspnea, difficulty in walking or climbing, fatigue/increased need to rest, and fatigue/low energy, and an emotional/cognitive symptom cluster that consisted of worrying, feeling depressed, and cognitive problems.

Heart failure (HF) is a growing health concern throughout the world. In the United States alone, the estimated prevalence of HF is around 5.8 million (Roger et al., 2012). Heart failure incidence has not declined for two decades (Roger et al., 2012). Heart failure affects at least 15 million of the 900 million persons in the 51 European countries represented by the European Society of Cardiology (Stromberg and Dickstein, 2008). Approximately 40% of these patients are dead or readmitted within one year of hospital discharge (Stromberg and Dickstein, 2008). Despite limited knowledge about HF epidemiology in Asian countries, it is clear that HF prevalence is increasing along with the aging of that population and increased survival of patients experiencing coronary events (Alla et al., 2007; Jiang and Ge, 2009).

Information about the patient symptom experience is essential because efficacious symptom management is a major focus in HF. An important feature of the symptom experience in HF is that patients experience multiple symptoms simultaneously, and these symptoms are associated with detrimental outcomes (Bekelman et al., 2007; Blinderman et al., 2008; Ekman et al., 2005; Heo et al., 2008; Jurgens et al., 2009; Lee et al., 2010; Song et al., 2010; Zambroski et al., 2005). Thus, investigating co-occurring symptoms as symptom clusters may assist health care providers to better understand the symptom experience of patients with HF thereby allowing them to perform more effective clinical management.

A symptom cluster consists of two or more co-occurring symptoms (Miaskowski et al., 2007). Although symptoms within a cluster are strongly related, they do not necessarily share a common etiology (Miaskowski et al., 2007). There is increasing evidence to suggest that symptom clusters may be more predictive of outcomes than singly occurring symptoms.

Symptoms are conceptualized as subjective phenomenon reflecting perceived alterations in normal function (Dodd et al., 2001; Rhodes and Watson, 1987). Functional or structural abnormalities in body organs and systems are reflected as symptoms. The reality of the person in the context of his or her cultural and personal situation is a major component of symptom expression (Good and Good, 1981). Thus, patients with HF may have different symptom experiences and symptom clusters depending on their cultural background. For this reason, it is meaningful to perform international comparisons of symptom clusters and identify any differences. Accordingly, our specific aim was to identify and compare symptom clusters in the United States, Europe, and Asia.

1. Methods

This study was an observational, comparative investigation of differences in symptom clusters in each of regions studies. We included data from the United States, Europe (the Netherlands and Sweden) and Asia (China and Taiwan).

1.1. Patients and settings

Purposive sampling was used to recruit patients with HF from in- and out-patient settings in five countries: China, the Netherlands, Sweden, Taiwan, and the United States from 2008 through 2011. They were eligible for the study if they met the following selection criteria: (1) confirmed diagnosis of HF with either preserved or non-preserved systolic function; (2) no admission for myocardial infarction or stroke within the previous 3 months because these conditions substantially alter the typical HF symptom experience; (3) free of serious debilitating comorbidities such as end-stage renal or liver disease; (4) free of cognitive impairments that might hinder ability to participate in an interview with research nurses; and (5) on a cardiac transplantation waiting list.