



## A comparative study of fluid management education before hospital discharge



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### ABSTRACT

**Objectives:** We examined if an education intervention [Edu] based on the Common Sense Model theoretical framework and 3-step action plan to control fluid-related symptoms and weight gain, decreased 6-month health care consumption.

**Background:** Heart failure (HF) morbidity is often related to fluid overload.

**Methods:** A 2-group comparative design with convenience sampling was used to assess rehospitalization (Hosp), emergency department (ED) and unplanned office visits. Analyses included regression models.

**Results:** Of 122 usual care [UC] and 122 Edu patients, mean (standard deviation) age was 65.8 (12.6) years. In multivariate analyses, first HF Hosp, total ED visits and ED visits for HF decompensation were lower in Edu compared to UC;  $p = 0.039$ ,  $p = 0.025$ , and  $p = 0.001$  respectively. There were no reductions in 6-month total Hosp or HF-related unplanned office visits.

**Conclusions:** An Edu with a 3-step action plan to control fluid-related symptoms and weight gain reduced first Hosp, total ED and HF-ED visits.

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Heart failure (HF) is a chronic, progressive condition that is a burden to patients and to health care systems. Hospitalization rates and cost of care are high and the burden will continue to grow as more baby-boomers become elderly.<sup>1</sup> Education interventions delivered in the hospital, before discharge may enhance clinical outcomes. For example, research that involved delivery of one-on-one, 1-h long education to patients was effective in reducing rehospitalization rates, compared to control subjects.<sup>2–5</sup> It is important to learn if nurse-delivered education during hospitalization, that is designed using a theoretical model of health behavior is superior to unstructured education of HF self-care principles in improving clinical outcomes.

The Common Sense Model of Illness Beliefs theoretical framework is a self-regulation model of health behavior. In the Common Sense Model of Illness Beliefs framework, patients' behavior is based

on two main inputs, (1) implicit cognitive processes (5 illness representations; labeled: identity [sensations/symptoms], cause, timeline, consequences and control [or cure]) that form a level of threat in reaction to sensory stimuli (symptom location, duration, severity, etc.) and (2) cognitive and emotional responses of threat and danger that lead to formation of a plan of coping actions (self-care) to decrease the threat.<sup>6</sup> Patients assign meaning to the stimuli, and also, have emotional responses that form a feeling state imposed by the illness representation threat.<sup>7</sup> The model includes self-regulatory feedback in that, when the illness threat is reduced, patients are likely to adhere to self-care behaviors over time; see Fig. 1.<sup>6–12</sup> The Common Sense Model guided development and delivery of the enhanced education intervention in that written handouts included illness representations themes, some of which, for example, consequences, were not presented in other handouts or wording did not convey the seriousness of HF in relation to mortality.

### Literature review

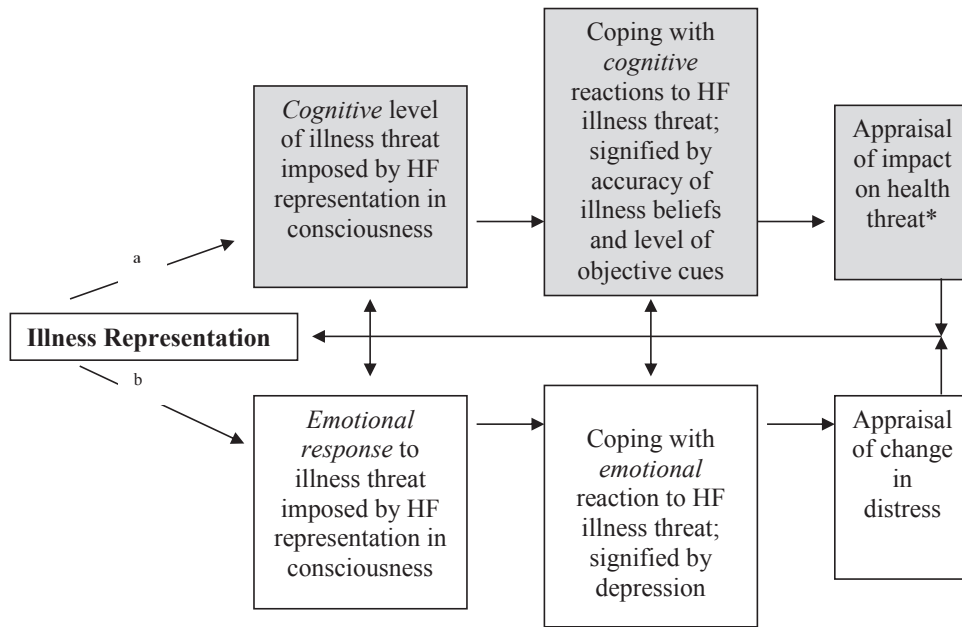
In patients with chronic HF, acute decompensation is common<sup>13</sup> and often involves fluid overload. When a composite congestion score of 6 signs and symptoms – dyspnea, orthopnea, fatigue, rales,

**Abbreviations:** HF, Heart failure; HF-rEF, Heart failure with reduced ejection fraction; HF-pEF, Heart failure with preserved ejection fraction; SD, Standard deviation.

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**Fig. 1.** The Common Sense Model of Illness Representation (Beliefs) theoretical framework, applied to patients with heart failure (HF). In this study, content labeled by shaded boxes is addressed. An illness representation is constructed from stimuli (that can come from many sources such as media, current sensations, and past experiences). Generally, representations have five attributes: identity (what HF means and signs and symptoms), timeline (how long HF lasts), cause, consequences (long-term effects) and cure/control (in HF, focus is on actions to control it). An illness beliefs representation is derived from information that is organized, analyzed and interpreted to form implicit theories of HF and HF treatment. A HF representation is processed *cognitively* (objectively)<sup>a</sup> to form a level of threat, danger and vulnerability imposed by HF. HF representation is also processed *emotionally* (subjectively)<sup>b</sup> to form a feeling state imposed by both the HF representation itself and by the cognitive processing of the HF representation. The two processing systems ultimately determine the level of threat imposed by HF and lead to goals for coping and coping actions (\*, HF self-care behaviors known to decrease morbidity; such as daily weight monitoring, low sodium diet, and fluid restriction).

pedal edema, and jugular venous distension was used, scores were high at hospital admission, and dropped significantly at discharge, reflecting that medical treatment involved fluid overload.<sup>14</sup> Post hospital discharge, worsening congestion was associated with HF decompensation and rehospitalization.<sup>15</sup> In multivariate analyses, patients with HF and preserved and ejection fraction (HF-pEF) had dilated inferior vena cava and patients with HF and reduced EF (HF-rEF) had low serum sodiums,<sup>15</sup> both of which indicate a fluid overload state. Although guideline-directed medical therapy includes treatment of fluid overload, and patient/family education on self-care themes for fluid overload has been part of guideline content since 1995,<sup>16</sup> more attention is needed on educating patients about non-pharmacologic action steps that can decrease new onset of worsening of signs and symptoms of fluid overload as a means of slowing rehospitalization.

A major purpose of educating patients with HF is to decrease fluid overload and to help patients self-intervene when it occurs. Weight monitoring, low sodium diet and fluid restriction are three classic self-care behavior themes related to fluid management<sup>17,18</sup>; however, education strategies that promote self-care behaviors have not been consistently reported. In ambulatory care<sup>19</sup> and hospital settings,<sup>20</sup> health care providers are expected to educate patients on strategies to reduce fluid overload. However, nurses may not have knowledge of fluid overload education messages<sup>21</sup> or comfort in delivering fluid overload prevention education.<sup>22</sup> Further, nurses may not deliver education with high enough frequency<sup>22</sup> or use education styles that promote self-care actions post discharge. Revising the methods of delivery of patient education on weight monitoring, low sodium diet and fluid restriction might enhance patient's knowledge and assist with adherence to self-care behaviors that lead to a decrease in health care consumption (rehospitalization, emergency department and unplanned office visits).

Not all education interventions resulted in reduction of morbidity or mortality. In rural patients who received face-to-face education

interventions versus usual care<sup>23</sup> there were no differences between groups in cardiac death or HF hospitalization, and in patients who received multiple education sessions, tips sheets and telephone calls for 1 year, there were no differences between groups in death or HF hospitalization.<sup>24</sup> In a systematic review of 9 studies of the effectiveness of self-management interventions (many of which included education as a primary intervention) on mortality, rehospitalization, and HF hospitalization, only 1 research team reported a reduction in mortality among intervention patients. In 3 of 8 reports, interventions reduced all-cause rehospitalization and in 2 of 4 reports, interventions reduced HF hospitalization rates.<sup>25</sup> Authors of the systematic review<sup>25</sup> and others that assessed the level of information provided about education programs in HF<sup>26</sup> found methodological issues and a lack of detail about patients, educational methods used and protocols used in evaluation. The purpose of this study was to examine if 6-month unscheduled health care consumption was reduced after introduction of a nurse-delivered 3-step action plan with focused education on symptom control and weight gain using the Common Sense Model of Illness Beliefs approach. The research question was: Does patient health care consumption outcomes (rehospitalization, emergency department and unplanned office visits) at 6-months decrease after implementing a focused education program using the Common Sense Model of Illness?

## Methods

Researchers used a 2-group pre- and post-intervention comparative, single-blinded design with convenience sampling and medical record review to answer the research question. A randomized controlled design was not feasible. Clinical nurses who delivered usual care could have heard and seen investigators delivering the intervention at patients' bedsides and might have learned new information about HF self-care themselves that might have been used in usual care education delivery; thereby, diluting

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