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## Pilot testing of the effectiveness of nurse-guided, patient-centered heart failure education for older adults

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## ABSTRACT

Heart failure (HF) is the most common cause of hospitalization and rehospitalization among those 65 years and older. Effective HF self-management is recommended for reducing readmissions. This pilot study, through a one-group, pretest-posttest design, examines the effects of nurse-guided, patient-centered HF education on readmissions among older adults (n = 26) in a post-acute care unit. All selected participants received 3 sessions of tailored patient education. Their knowledge and self-care skills were measured pre- and post-intervention with the Atlanta Heart Failure Knowledge Test (A-HFKT) and the Self-Care of Heart Failure Index (SCHFI). Patients' HF-related knowledge and self-care skills showed statistically significant improvements, and only 1 patient was rehospitalized for any HF-related reason within 30 days post-discharge. These results suggest that HF rehabilitation teams could support better patient outcomes by assigning nursing staff to provide individualized patient education, as this can help ensure that patients understand discharge instructions for effective self-care.

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Affecting around 6 million people in the United States, heart failure (HF) is a debilitating disease, a serious public health problem, and a common cause of hospitalization for older adult patients.<sup>1,2</sup> HF prompts the spending of \$30.7 billion healthcare dollars each year. Moreover, the incidence and prevalence of this condition will only continue to increase as the U.S. population ages.<sup>3</sup> Individuals over age 65 account for more than half of all cardiovascular hospital admissions and 80% of all cardiovascular deaths in the U.S.<sup>4</sup> Despite advances in diagnostic technology and medical and surgical treatments, HF still carries a substantial risk of death among older adults.<sup>1</sup>

HF-related hospitalizations result in enormous social and economic costs, not just to patients, families, and communities, but also to healthcare systems more broadly.<sup>5</sup> Viewed as a quality indicator of care provided, hospital readmission is used as an accountability measure in decisions regarding Medicare reimbursement through the Patient Protection and Affordable Care Act (PPACA), and the Centers of Medicare and Medicaid Services (CMS) have reduced payments and penalized hospitals with excessive readmission rates for specific disease conditions, including HF.<sup>6</sup> The U.S. spends an estimated \$15 billion on hospital readmissions each year,<sup>1</sup> and HF is the most common diagnosis for readmissions among older adults.<sup>1,5</sup>

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Common reasons for HF readmissions include poor patient education, insufficient discharge planning, absence of continuation of care, lack of compliance with medication regimens, and poor adherence to patient instructions.<sup>7</sup> However, many strategies – eg, home visits, telephone follow-up, nurse-led HF clinics, and cardiac rehabilitation – can prevent rehospitalization.<sup>8,9</sup>

This latter strategy, cardiac rehabilitation (CR), deserves further elaboration. Post-acute care (PAC) is a division of the healthcare system that provides ongoing medical care, therapeutic rehabilitative services, and skilled nursing care. CR in PAC units is a relatively new concept. Recuperating from a cardiac event is difficult, especially for older adult patients, most of whom present with psychological and physical challenges that continue after discharge. However, PAC rehabilitation assists patients in regaining their independence and returning home. Its documented benefits include shorter hospital stays, faster recuperation, reduced hospital readmissions, and delayed entry into nursing homes.<sup>10</sup>

One observational study of 15,459 HF patients aged 65 years and older, released from acute care to skilled nursing facilities, found that these patients suffered higher rates of adverse events, including hospital readmissions and an increased 1-year mortality rate, compared to those who were discharged to their homes.<sup>11</sup> On average, patients discharged to PAC units after hospitalization for acute HF are older, have longer hospital stays, are predominantly women, and have multiple comorbidities.<sup>12</sup> In addition, they may have cognitive impairments, decreased mobility, and poor social

support. However, the epidemiology of post-acute HF patients and their clinical outcomes has not been well studied.<sup>12</sup>

Education about heart-healthy living is an important component of CR. Multiple studies support the effectiveness of nurse-guided, patient-centered educational interventions in increasing cardiac patients' knowledge and self-care management skills.<sup>5,13,14</sup> Such education is proven to be a relatively low-cost and effective means of preventing readmissions,<sup>15</sup> and patients' knowledge of self-care behaviors, such as monitoring of symptoms, observance of dietary limitations, and medication compliance, is effective to this end.<sup>16</sup> Various methods and materials have been tested for patient education, such as distributing patient education booklets,<sup>17</sup> supplementing booklet-based learning with DVD materials,<sup>13</sup> holding group classes,<sup>14,18</sup> and even using interactive games.<sup>19</sup> While patient education has been found to improve knowledge and self-care skills regardless of the methods or materials used, the teaching method most appropriate specifically for older adult HF patients in a PAC unit, and the extent of the method's effectiveness in improving readmission rates and self-care skills, remains to be identified.

This pilot study examines the effectiveness of a nurse-guided, patient-centered heart failure education program on the knowledge retention and self-care management behaviors of older adult heart failure patients in a post-acute cardiac rehabilitation unit. As a concurrent aim, it seeks to evaluate whether such tailored educational measures might correlate with decreased readmission rates. The authors hypothesize that personalized, nurse-guided HF education will improve patients' self-care knowledge and skills and that these gains will reduce their likelihood of readmission. The current study contributes to the existing body of research by (1) focusing specifically on heart failure education for post-acute care heart failure patients within a nursing home setting and (2) involving a nurse-led heart failure educational intervention tailored to each individual patient.

## Methods

This interventional pilot study employed a nonrandomized, quasi-experimental model without a control group. The older adult patients for this study were selected from a post-acute rehabilitation unit in a 508-bed nursing home in New York City. The researcher obtained institutional review board approvals from Wilkes University and the nursing home where the research was conducted. The nursing home's electronic medical records were then screened for diagnosis and age in order to identify prospective participants from among admissions to the home's PAC units over a period of several days.

Patients who were 65 or older and had a diagnosis of HF met the preliminary eligibility criteria. These individuals were given a flyer that described the study and invited them to participate. Those who were interested in participating were then screened with the Brief Interview of Mental Status (BIMS). Anyone who scored 7 or lower on the BIMS or who did not speak English was ineligible for participation. Finally, eligible patients' voluntary participation was ensured by their signing of consent forms before the intervention began. The instruments, intervention design, and intervention materials used in this study are discussed below.

### Instruments

#### Brief interview of mental status

The Brief Interview of Mental Status (BIMS), used in this study in screening prospective participants for eligibility, is a 15-item instrument measuring memory, judgment, and orientation.<sup>20</sup> This instrument is used in nursing homes as part of the Minimum Data

Set (MDS 3.0), the latter of which is part of the U.S.'s federally mandated process for clinical assessment of all residents in Medicare- or Medicaid-certified nursing homes. The MDS 3.0 is reliable and highly correlated with both the Cognitive Performance Scale and the Modified Mini-Mental State Examination.<sup>21</sup>

#### Self-care of heart failure index

Consisting of 22 items, the Self-Care of Heart Failure Index (SCHFI) version 6.2 measures the phenomenon of self-care along three category-subcales: self-care maintenance, self-care management, and self-care confidence. Effectively, this instrument measures the behaviors a patient performs to prevent rehospitalization. It serves as a component of the pretest and posttest administered in the current study. Higher scores on this instrument reflect better self-care. Previous studies have confirmed this instrument's overall reliability and the construct validity of its individual subscales.<sup>22,23</sup> The developers of the SCHFI put it in the public domain "ready to be used by investigators;" no special permissions for use of this instrument were or are required.<sup>24</sup>

#### Atlanta heart failure knowledge test

Also a component of the pretest and posttest used in this study, the Atlanta Heart Failure Knowledge Test (A-HFKT) version 2 was developed to measure the knowledge of patients and their families regarding heart failure.<sup>25</sup> The tool contains 30 multiple-choice items on HF-related pathophysiology, nutrition, behaviors, symptom management, and medications. Its content validity in use with patients and their relatives was first confirmed by the original researchers; later, a systematic review found the A-HFKT to be the instrument best suited for evaluating patients' HF knowledge.<sup>26</sup> Permission to use this tool was obtained from the tool's developer.

#### Intervention materials

##### Managing Heart Health – booklet

The *Managing Heart Health* booklet was developed by Mount Sinai Hospital<sup>27</sup> and used in this study with the hospital's permission. It comprises all the information that an HF patient needs in order to learn how to administer and maintain self-care outside the hospital or nursing facility setting. This booklet is written in simple language, at the fifth-grade reading level, for easy understanding. It also features large font, color contrast, and pictures. All of these features make the booklet a suitable choice for use with older adults with varying levels of health literacy and vision and/or cognitive impairments. The principal investigator personally read this booklet to those patients who were unable to read the large font.

##### Heart Failure Patient Education – YouTube video

The *Heart Failure Patient Education* video<sup>28</sup> was developed by the American Association of Heart Failure Nurses (AAHFN) and is available to the public on YouTube. Permission for use in this pilot study was obtained from the AAHFN.

#### Intervention design

The intervention began with a pretest measuring each patient-participant's HF-related self-care skills, self-care confidence, and knowledge. The pretest was composed of the Self-Care of Heart Failure Index (SCHFI) version 6.2 and the Atlanta Heart Failure Knowledge Test (A-HFKT) version 2. Thereafter, participants received a minimum of 3 individualized educational sessions during their stay at the PAC units. Each session lasted for 15 to 20 minutes.

In Session 1, all patients were asked to watch the *Heart Failure Patient Education* video individually before having a small discus-

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