



## Family partnership and education interventions to reduce dietary sodium by patients with heart failure differ by family functioning



Sandra B. Dunbar, PhD, RN, FPCNA, FAHA, FAAN<sup>a</sup>,  
 Patricia C. Clark, PhD, RN, FAHA, FAAN<sup>b</sup>, Kelly D. Stamp, PhD, ANP-C, RN, FAHA<sup>c,\*</sup>,  
 Carolyn M. Reilly, RN, PhD<sup>a</sup>, Rebecca A. Gary, RN, PhD, FAHA, FAAN<sup>a</sup>,  
 Melinda Higgins, PhD<sup>a</sup>, Nadine Kaslow, PhD<sup>d</sup>

<sup>a</sup>Nell Hodgson Woodruff School of Nursing, Emory University, Atlanta, GA, USA

<sup>b</sup>Georgia State University, Byrdine F. Lewis School of Nursing, Atlanta, GA, USA

<sup>c</sup>Boston College, School of Nursing, Chestnut Hill, MA 02467, USA

<sup>d</sup>School of Medicine, Emory University, Atlanta, GA, USA

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### ABSTRACT

**Objectives:** Determine if family functioning influences response to family-focused interventions aimed at reducing dietary sodium by heart failure (HF) patients.

**Background:** Lowering dietary sodium by HF patients often occurs within the home and family context.

**Methods:** Secondary analysis of 117 dyads randomized to patient and family education (PFE), family partnership intervention (FPI) or usual care (UC). Dietary sodium measures were obtained from 3-day food record and 24-h urine samples.

**Results:** In the poor family functioning groups, FPI and PFE had lower mean urine sodium than UC ( $p < .05$ ) at 4 months, and FPI remained lower than UC at 8 months ( $p < .05$ ). For good family functioning groups, FPI and PFE had lower mean sodium levels by 3-day food record at 4 and 8 months compared to the UC group.

**Conclusion:** Optimizing family-focused interventions into HF clinical care maybe indicated.

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### Introduction

Promoting heart failure (HF) self-care, especially the reduction of dietary sodium (Na) is challenging for patients and their families. The current clinical guidelines recommend that persons with HF (stage C) consume a low Na diet consisting of 2–3 g per day.<sup>1</sup> However, this change in lifestyle is difficult to achieve and maintain, and consequently HF patients revert back to a higher Na diet relatively quickly. HF patients and family members' efforts to follow a lower Na diet are difficult due to the amounts of hidden Na in foods, food preferences based on life long patterns, culture, and desire for foods to have a more 'salty' taste.<sup>2,3</sup> The family member frequently engages in shopping and food preparation and may not be knowledgeable about low Na strategies. In addition, patients with HF are usually not objectively aware or counting their daily Na intake, therefore they may mistakenly believe that

they are following a lower Na diet than what they actually consume.

Due to the chronic nature of HF, family members can provide social support, motivation, and positive communication that are a crucial component to the HF patient performing effective and sustainable self-care.<sup>4–6</sup> They can provide support through encouragement, empathy, and a sense of choice regarding self-care for the HF patient. Individuals with HF are more likely to perform health behaviors (e.g. low Na diet), or change unhealthy behaviors when they feel a sense of autonomy, competence and support by family members.<sup>6–8</sup>

The purpose of this study was to conduct a secondary analysis of a previously reported family education and partnership intervention<sup>3</sup> to examine: 1) the relationship between family functioning and dietary Na intake in persons with HF at baseline and 2) the effect of family context (family functioning) on the response to two types of patient and family interventions. The interventions that were tested against a usual care group included patient and family education and a family partnership intervention. The interventions and the clinical trial testing the effect of the interventions on self-care behaviors are reported elsewhere and

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\* Corresponding author. Tel.: +1 617 552 2119.

E-mail address: [stampk@bc.edu](mailto:stampk@bc.edu) (K.D. Stamp).

identify the positive role of patient and family educational and support interventions on dietary Na intake.<sup>3,6</sup>

## Methods

### *Study population and design*

This was a secondary analysis of the data from a 3-group randomized control trial of usual care (UC), patient family education (PFE), and family partnership intervention (FPI).<sup>3</sup> HF patients and one family member ( $n = 117$ ) were randomized as dyads with data collection occurring at baseline, 4 and 8 months. The study was based on the model of heart failure self-care, which depicts the influence of individual patient antecedents (including demographic, clinical, behavioral factors), on self-care management and outcomes in heart failure within the influence of a family context.<sup>4</sup> Greater details of study methods, interventions and consort flow chart have been described elsewhere<sup>3,6</sup>; however, a brief description has been provided below. The Emory University Institutional Review Board and all participating sites approved all study protocols and the informed consent.

The ( $n = 117$ ) dyads were recruited from 3 large academic medical centers in the southeastern U.S. that were affiliated with HF outpatient clinics. Inclusion criteria for the HF patients were: (1) diagnosis of HF confirmed in the medical record, NYHA class II–III, (2) age 30–79 years, (3) ability to read, write and speak English, (4) telephone access, (5) on medication that included ACE-inhibitors or angiotension II receptor blockade, beta-blocker and diuretics unless contraindicated (6) ambulatory, (7) glomerular filtration rate  $> 30$  ml/min and (8) availability of a participating family member who assisted with HF self-care.<sup>3,6</sup>

Exclusion criteria for patients with HF: (1) myocardial infarction within the last 6 months, (2) unstable angina, (3) renal failure, (4) impaired cognition, (5) psychiatric diagnosis of schizophrenia, dementia or any other mental health condition that would impair their ability to participate, (6) HF secondary to a treatable medical condition, (7) planned cardiac surgery or (8) uncorrected visual or hearing problems.<sup>3,6</sup> Exclusion criteria for the family member was age less than 19 years, non-agreement to participate, or a cognitive impairment or psychiatric diagnosis that would affect their ability to participate and follow the intervention.<sup>3</sup>

### *Intervention groups*

#### *Usual Care (UC)*

UC group received usual care from their providers and was provided with educational pamphlets that were created by the Heart Failure Society of America (HFSA), which focused on HF self-care, dietary Na and medication adherence.

#### *Patient Family Education (PFE)*

The dyads assigned to the PFE group received UC as described above, the HFSA pamphlets, and an initial 1-h education session delivered by a trained research nurse. Participants received written and DVD educational content, which included additional general information about HF symptoms and self-care. The dyads attended a second, 2-h, group session led by a trained research nurse and registered dietician to reinforce education on diet adherence, label reading and Na alternatives. HF participants received feedback about their usual Na intake (see outcome measures; dietary sodium intake) and after 4-months, they received a telephone education booster session. In addition, newsletters were mailed to participants detailing strategies for maintaining a low Na diet.<sup>3,6</sup>

#### *Family Partnership Intervention (FPI)*

Dyads received the same education and counseling as described in the UC and PFE groups plus 2-additional 2-h group sessions that focused on teaching the dyads how to give support, communication, empathy, and autonomy support for one another's roles. The family member was counseled on how to decrease criticism and give autonomy support to the HF patient through motivating messages, increase family-problem solving, give choices to support the patient to have more control concerning their self-care, and to promote patient confidence. In addition to the written and DVD education described above, the dyads received written information about family partnership and autonomy support.<sup>3,6</sup>

### *Demographic and clinical variables*

Baseline demographic and clinical characteristics were collected by self-report and from the medical record for each HF participant. The Charlson Comorbidity Index was used to determine other chronic conditions.<sup>9</sup> Additionally, type and dose of diuretics were collected and furosemide equivalents were calculated to account for residual effects of loop diuretics on Na excretion.<sup>3,10</sup> Characteristics of age, sex, relationship to HF participant and education level were obtained via self-report from the family member.<sup>3</sup>

### *Family functioning*

The Family Assessment Device Questionnaire (FAD) measures family functioning via a 53-item scale that was derived from the McMaster Model of Family Functioning.<sup>6,11</sup> The FAD is used to describe the overall health and dynamics of the family group and the patterns of communication among family members.<sup>11</sup> In this study, we focused on the 12-item global family function (GFF) subscale, which assesses the participant's perception of the overall family health.<sup>6,11</sup> Types of questions on the FAD that measured GFF were 'planning family activities is difficult because we misunderstand each other,' or 'there are lots of bad feelings in the family.'<sup>11</sup> For each question the HF patient would choose from 1 (strongly disagree) to 4 (strongly agree). The GFF ranges from 1 to 4 (healthy to unhealthy family functioning). Cronbach alpha for the GFF in this study was .90. The standard cut score for the GFF was 2.0.<sup>11,12</sup> The cut score was used to determine the percentage in the highest and lowest category for GFF, with score ( $>2$ ) indicating poor GFF and lower scores ( $\leq 2$ ) indicating better GFF. FAD-GFF was measured at baseline prior to randomization and interventions.

### *Depressive symptoms*

Depressive symptoms can be associated with adherence<sup>13</sup> and was included as a covariate in the primary analysis testing the interventions. The well-established 21-item Beck Depression Inventory II (BDI-II) was used to measure patient depressive symptoms.<sup>14,15</sup> The BDI-II assesses feelings of sadness, guilt, self-criticism, tearfulness, and feelings of cynicism or negativity. The items are on a scale from 0 to 3, representing the degree in which the symptoms were experienced in the past 2 weeks. The total scores range from 0 to 63, with scores  $\geq 14$  representing the presence of depressive symptoms. Cronbach alpha for this study was .90.

### *Outcome measures of dietary sodium*

Dietary Na was the main outcome and was measured in 2 ways: (1) 3-day food record and 24-h urine analyzed for Na, creatinine, and urea. At baseline, 4 and 8 months HF participants were asked to complete a 3-day food record. The 3-day food record was then reviewed for completeness, accuracy and portions of foods

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