Improving Self-Care for Heart Failure for Seniors: The Impact of Video and Written Education and Decision Aids

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Abstract

Heart failure poses a substantial burden on health care expenditures and quality of life; therefore, strategies to improve health behaviors for heart failure are essential. Highly effective medical decision aids can enable health improvements for people with heart failure. In this randomized controlled study, individuals with heart failure in a private Medicare plan were randomized into either an intervention or control group. Participants in the intervention group received basic program information and a simple fact sheet about heart failure, plus a medical decision aid, Living with Heart Failure DVD and booklet; patients randomized to the control group received the basic written materials only. The study was powered to detect a 5% difference in the primary outcome measure (daily weight monitoring). Participants were surveyed 4 weeks after outreach materials were mailed. There were 480 survey respondents: 246 in the intervention group; 234 in the control group. Intervention group respondents were significantly more likely to weigh themselves daily (P = 0.05) than control group respondents (44% versus 38%). The intervention group was more likely than the control group to monitor fluid intake (47% versus 44%) and follow a low-sodium diet (83% versus 77%). Other health behavior differences were not statistically significant. The DVD decision aid increased levels of daily weight monitoring and other important health behaviors. Broad application of inexpensive behavior change interventions, such as a DVD/booklet program, should help to facilitate important, routine self-care behaviors for individuals with heart failure. (Population Health Management 2012;15:xx–xx)

Introduction

Heart failure has become a major public health problem in the United States. In 2006, approximately 5.8 million Americans had diagnosed heart failure. The incidence of heart failure approaches 10 per 1000 individuals after age 65. The health care costs associated with heart failure are burgeoning. The American Heart Association estimated the total cost of this chronic disease to approach $39.2 billion in 2010. Patient hospitalizations cause a significant proportion of heart failure-related expenditures. From 1990 to 1999, the number of annual hospitalizations for individuals with a primary or secondary heart failure diagnosis increased from 2.4 million to 3.6 million.

As our population ages and health care costs rise, it is imperative to develop innovative strategies to better manage the health of individuals with heart failure and to prevent hospitalizations. The 2005 meta-analysis by Roccaforte et al. provided evidence that disease management programs for heart failure are effective at reducing mortality and hospitalizations. Successful disease management for individuals with heart failure requires compliance with pharmacological and nonpharmacological therapies (eg, sodium restriction), physical activity, and daily measurement of weight. In particular, frequent weight monitoring is essential because dramatic changes in body weight are indicative of fluid balance issues and frequently can lead to urgent hospitalizations. Frequent monitoring of clinical values, including weight, can improve health outcomes for heart failure.

According to Riegel et al, heart failure self-care is defined as a decision-making process involving behavior choices that maintain physiologic stability (maintenance) and the

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response to symptoms (management). Self-care maintenance is defined as routine symptom monitoring and treatment adherence, whereas self-care management is characterized as a process initiated by symptoms, which stimulates the use of self-care treatments and treatment evaluation. Supporting strategies, such as patient and health care provider communication, counseling, and education, have been shown to improve clinical outcomes and reduce hospitalization rates for those with heart failure. Despite evidence supporting the value of various disease management approaches, the impact of educational in-home videos (medical decision aids) on self-care behaviors for individuals with heart failure has not been well studied.

This study intends to determine the relative benefits of 2 broadly distributed direct mail interventions: (1) basic program information and a simple fact sheet about heart failure (standard materials) versus (2) these standard materials plus a medical decision aid to improve outcomes for individuals with heart failure. The medical decision aid used was an evidence-based DVD and booklet that highlights the daily steps that individuals with heart failure can take to manage their condition, stay out of the hospital, and improve their quality of life. It also explains the association between fluid buildup and the symptoms of heart failure, and it emphasizes important self-care behaviors. The program was developed with input from medical experts and from patients with heart failure; it integrates both of these viewpoints. Health Dialog typically supplies individuals with decision aids only in the context of one-on-one telephonic support provided by a clinician in its care management programs. We designed this study to test much broader distribution methods. The study allows us to understand the combined benefit of the decision aid itself and the broad distribution of these materials without additional telephonic support. We attempted to conduct a telephone survey with all study participants after the intervention. We also conducted analysis of medical claims data.

Methods

Study population

Members who purchased Medicare Advantage coverage offered by a large not-for-profit health plan were considered eligible for the study. All of those members who were identified as having heart failure (by assessing medical and pharmacy health care claims), were 18 years or older, and had a valid telephone number and mailing address were selected for the study. Using this process, 2349 members were selected for the study.

Study design

We structured the evaluation using a randomized controlled study design to reduce potential bias and enable unconfounded differences in outcomes to be measured. We performed the trial in accordance with a protocol that was approved by an independent institutional review board (Schulman Associates Institutional Review Board [SAIRB]): Prospective Assessment of Videos as Education for Heart Failure (PAVE): A Prospective, Observational Randomized Trial to Assess the Clinical and Financial Impact of Educational Videos for Subjects with Chronic Heart Failure. PAVE-HD012007. The IRB waived informed consent because of the very minimal risks to study participants.

We randomly assigned individuals in the study population identified with heart failure to either the intervention or control group at a 1:1 ratio. Samples were stratified on key factors such as sex, age category, and existence of 1 or more comorbid conditions. We mailed those in the control group basic program information and a simple fact sheet about heart failure (standard materials; Appendix A); we mailed these standard materials plus the medical decision aid to the intervention group. Individuals with specific risks and needs (as determined by claims and other analysis) in both groups were included in other outreach and educational programs (including mail, interactive voice response calls, and outbound health coach calls) through Health Dialog’s care management programs. The randomized design was intended to minimize differences in the levels of services. Rates of health coaching resulting from the mailing were extremely low for both groups. Overall, about 0.7% of individuals responded to the mailing by calling a health coach.

This randomized educational effort was conducted in 2 study waves that coincided with 2 launches of care management services to separate subgroups of the health plan’s Medicare Advantage population. At the time of wave 1, only 363 individuals were identified as eligible for the study, thereby making an additional study wave necessary. A much larger sample of eligible individuals was identified at the time of wave 2 (Table 1). Wave 1 took place in March 2007 and wave 2 in January 2008; randomization was performed for each wave.

After each wave of educational outreach was mailed, we attempted to contact all participants in both the control and intervention group by telephone to complete a survey. We combined results from completed surveys for waves 1 and 2 and have reported them as such in this analysis. We performed analysis to compare the experiences of individuals who received standard educational outreach plus the medical decision aid to similar individuals who received standard educational outreach only. Additionally, medical and pharmacy claims were assessed to determine health care cost and utilization differences between the intervention and control groups.

Intervention

In late 2006, Health Dialog collaborated with the Foundation for Informed Medical Decision Making to release the Shared Decision-Making Program entitled Living with Heart Failure: Helping your Heart Day-to-Day. This 29-minute DVD-format decision aid, which includes a 38-page booklet on the same subject material written at a fifth-grade reading level, is intended for adults who have heart failure symptoms, and

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<tr>
<th>Table 1. Study Wave Samples</th>
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<tr>
<td><strong>Study wave 1</strong> (n = 363)</td>
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<tr>
<td>Intervention group</td>
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<tr>
<td>Control group</td>
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<tr>
<td><strong>Study wave 2</strong> (n = 2076)</td>
</tr>
<tr>
<td>Intervention group</td>
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<tr>
<td>Control group</td>
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provides valuable information patients need to know in order to make informed decisions regarding their health condition. (A detailed program description of the Living with Heart Failure: Helping your Heart Day-to-Day decision aid is available from the authors upon request.) The release of this new DVD program provided optimal timing to launch a study to test the video materials by presenting them as part of introductory health education materials provided to a new population of individuals eligible for Health Dialog’s care management who also had heart failure. In 2007, a large regional health plan launched a program with Health Dialog to provide care management services to enrollees in its managed Medicare products. Key objectives of these services include improving care processes and outcomes and reducing unnecessary costs of care for the entire population.

Survey question development

Survey questions included the SF-12 Health Survey, version 2,14 demographic questions from the US census, and a series of questions developed specifically for this study to assess heart failure symptoms, provider interactions, and self-care behaviors. In addition, individuals who were sent the DVD/booklets were asked a set of questions developed specifically for this study on their reactions to the DVD/booklet material.

Survey process

We obtained survey responses by telephone. An independent research firm (ORC Guideline) attempted to contact all study participants via telephone. The intervention group survey included additional satisfaction items regarding the Living with Heart Failure program. (The telephone script and survey are available from the authors upon request.) Data collection for the survey was conducted using a Computer Assisted Telephone Interviewing system and was initiated 4 weeks after educational outreach materials were mailed to both groups. Up to 6 phone call attempts to collect survey data were made during the evenings, Monday through Friday, and Saturday mornings and afternoons. A cash incentive of $5.00 was offered to all survey respondents for completing the phone interview.

We applied data validation methods to ensure that self-reported data included in our analysis were reliable. We checked survey skip patterns for accuracy, removed invalid responses resulting from data entry error, and required at least an 80% completion rate for the survey to be included in the analysis.

Study measures

Self-care. Study participants were surveyed about daily self-care behaviors essential to managing heart failure; individuals were asked if they weighed themselves, monitored their fluid intake, followed a low-sodium diet, and engaged in physical activity every day, most days, some days, or no days in the past 4 weeks. Daily weight monitoring was the primary outcome measure for this evaluation.

Health care provider interaction. Because the Living with Heart Failure program was designed to support an informed dialogue between patients and providers in order to facilitate joint health care decisions, study participants who either watched the Living with Heart Failure DVD or read the booklet were asked if they discussed the contents of either the DVD or accompanying booklet with a doctor or health care professional.

Health status. The SF-12, version 2.0, health survey measures general health status based on a 4-week recall; its reliability and validity have been documented.14 Responses to the 12-item survey are summarized into physical and mental health status scores, and are referred to as the Physical Component Summary (PCS) and the Mental Component Summary (MCS). The survey data were scored using the SF-12, v2 online scoring software, which computes scores based on a Norm-Based Scored scale of a mean of 50 with a standard deviation of 10. The summary scores range from 0 to 100 where higher scores indicate a better health status.

Living with Heart Failure program satisfaction. Program satisfaction was assessed for those in the intervention group who reported watching the Living with Heart Failure DVD and/or reading the booklet.

Health care costs. Medical and pharmacy claims for the study population were gathered in order to assess the medical cost impact of the Living with Heart Failure program; data were collected for the 12 months prior to the intervention and 6 months after the intervention. The primary outcome of interest was 6-month total medical costs; program impact was modeled using analysis of covariance (ANCOVA).15–18 Data for the 12 months of prior costs and demographic characteristics were used as covariates in the model. All costs were converted to per member per month by dividing paid claim amounts by the number of health plan eligible months. Analysis was limited to subjects with at least 1 month of health plan eligibility in both the pre- and postintervention periods. Because of high costs, which were largely unable to be impacted by the Health Dialog chronic condition care program, subjects with organ transplants or HIV/AIDS were removed from the financial analysis (Table 2).

Statistical analysis

We reported population characteristics as means and percentages. Statistical tests used to determine similarities between the intervention and control groups included the t test for continuous variables and the chi-square test for

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention group</th>
<th>Control group</th>
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<tbody>
<tr>
<td>Randomized</td>
<td>1170</td>
<td>1269</td>
</tr>
<tr>
<td>Exclusions due to organ transplant, HIV/AIDS</td>
<td>95 (8.1%)</td>
<td>105 (8.3%)</td>
</tr>
<tr>
<td>Exclusions due to no health plan eligibility in the intervention period</td>
<td>58 (5.0%)</td>
<td>73 (5.8%)</td>
</tr>
<tr>
<td>Included for medical cost analysis</td>
<td>1017 (87.0%)</td>
<td>1091 (86.0%)</td>
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percentages. Because the survey was administered in 2 different waves, we used the Cochran-Mantel-Haenszel test for categorical variables. Medical cost impact was modeled using ANCOVA. \( P \) values were calculated by using chi-square and Cochran-Mantel-Haenszel tests; statistical significance was reported as \( P < 0.05 \). All statistical analyses were performed using SAS, version 9.1 (SAS Institute Inc, Cary, NC).

Results

Study population

In total, 2439 eligible individuals were randomized into one of 2 study groups: 1170 of these individuals were assigned to an intervention group and 1269 were assigned to a control group. Because the survey was conducted 4 weeks after the outreach date, a number of factors, including different rates of individuals losing eligibility, resulted in survey sample size differences. We employed a stratified random sampling approach to divide the population into nonoverlapping strata based on the following characteristics: sex, age category, and whether the individuals had heart failure and no identified comorbidity chronic condition (diabetes, chronic heart disease, asthma, or chronic obstructive pulmonary disease), or heart failure and 1 or more of the identified comorbidity chronic conditions.

The randomized sampling process for this study resulted in very similar demographic characteristics between the intervention and control groups (Table 3). The majority of individuals in both groups were 75 years or older (76%) and female (55%). As expected, most individuals had a high likelihood of future costs; more than 80% of the individuals in the control and intervention groups were high risk. Health Dialog’s proprietary risk model predicting future costs was not overlapping strata based on the following characteristics: sex, age category, and comorbidity status.

Within study groups, the response rate difference was statistically significant at the \( P < 0.05 \) level. We detected significant differences in response rates by sex, age category, financial risk category, and comorbidity status. Survey response rates were similar by sex within each group (Table 4). The small differences in response rates were not statistically significant (\( P = 0.29 \) in the intervention group; \( P = 0.89 \) in the control group). However, individuals younger than age 75 were more likely to respond to the survey than those aged 75 or older. This difference was significant in both the intervention and the control group (\( P < 0.0001 \) in the intervention group; \( P = 0.0007 \) in the control group). We detected significant differences in response rates by comorbidity status as well; individuals with at least 1 additional identified chronic condition were more likely to respond to the survey than individuals identified to have

\[ \text{Table 3. Study Population Characteristics} \]

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention group ( (n = 1170) )</th>
<th>Control group ( (n = 1269) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, ( n ) (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 75</td>
<td>285 (24.4%)</td>
<td>304 (24.0%)</td>
</tr>
<tr>
<td>75 or older</td>
<td>885 (75.6%)</td>
<td>965 (76.0%)</td>
</tr>
<tr>
<td>Mean (( \pm SD ))</td>
<td>79.8 (( \pm 8.6 ))</td>
<td>80.0 (( \pm 8.7 ))</td>
</tr>
<tr>
<td>Median</td>
<td>80.0</td>
<td>81.0</td>
</tr>
<tr>
<td>Sex, ( n ) (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>528 (45.1%)</td>
<td>573 (45.2%)</td>
</tr>
<tr>
<td>Female</td>
<td>642 (54.9%)</td>
<td>696 (54.8%)</td>
</tr>
<tr>
<td>Comorbidity, ( n ) (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comorbid</td>
<td>984 (77.5%)</td>
<td>912 (78.0%)</td>
</tr>
<tr>
<td>Not comorbid</td>
<td>285 (22.5%)</td>
<td>258 (22.1%)</td>
</tr>
<tr>
<td>Financial Risk, ( n ) (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1010 (79.6%)</td>
<td>950 (81.2%)</td>
</tr>
<tr>
<td>Moderate/low</td>
<td>259 (20.4%)</td>
<td>220 (18.8%)</td>
</tr>
<tr>
<td>Mean (( \pm SD ))</td>
<td>85.35 (( \pm 24.1 ))</td>
<td>84.08 (( \pm 25.8 ))</td>
</tr>
<tr>
<td>Median</td>
<td>95.0</td>
<td>94.0</td>
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</table>

Note: By study group, there was a statistically significant difference within the control group (only) at the \( P < 0.05 \) level. Within study groups, the response rate difference was statistically significant at the \( P < 0.001 \) level. 1Individuals <75 years of age were more likely to respond to the survey than those age 75 and older; this difference was statistically significant at the \( P < 0.0001 \) level. 2No significant difference in age or financial risk categories and association with nonresponse.

Nonresponse bias

We performed analyses to determine whether nonrespondents were systematically different than respondents and to assess whether nonresponse was different in the control group in comparison to the intervention group. This survey was assessed for nonresponse bias by stratifying the survey responses by sex, age category, financial risk category, and comorbidity status. Survey response rates were similar by sex within each group (Table 4). The small differences in response rates were not statistically significant (\( P = 0.29 \) in the intervention group; \( P = 0.89 \) in the control group). However, individuals younger than age 75 were more likely to respond to the survey than those aged 75 or older. This difference was significant in both the intervention and the control group (\( P < 0.0001 \) in the intervention group; \( P = 0.0007 \) in the control group). We detected significant differences in response rates by comorbidity status as well; individuals with at least 1 additional identified chronic condition were more likely to respond to the survey than individuals identified to have

\[ \text{Table 4. Survey Response Rate by Study Group} \]

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention group ( (n = 246) )</th>
<th>Control group ( (n = 234) )</th>
<th>Total randomized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(^{+}), ( n ) (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 75</td>
<td>85 (29.8%)</td>
<td>76 (25.0%)</td>
<td>161 (27.3%)</td>
</tr>
<tr>
<td>75 or older</td>
<td>161 (18.2%)</td>
<td>158 (16.4%)</td>
<td>319 (17.2%)</td>
</tr>
<tr>
<td>Sex, ( n ) (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>112 (21.2%)</td>
<td>113 (19.7%)</td>
<td>255 (19.1%)</td>
</tr>
<tr>
<td>Female</td>
<td>134 (20.9%)</td>
<td>121 (17.4%)</td>
<td>255 (20.4%)</td>
</tr>
<tr>
<td>Comorbidity(^{+}), ( n ) (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comorbid</td>
<td>195 (21.4%)</td>
<td>196 (20.0%)</td>
<td>391 (20.6%)</td>
</tr>
<tr>
<td>Not comorbid</td>
<td>51 (19.8%)</td>
<td>38 (13.3%)</td>
<td>89 (16.4%)</td>
</tr>
<tr>
<td>Financial Risk(^{+}), ( n ) (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>204 (21.5%)</td>
<td>190 (18.8%)</td>
<td>394 (20.1%)</td>
</tr>
<tr>
<td>Moderate/low*</td>
<td>42 (19.1%)</td>
<td>44 (17.0%)</td>
<td>86 (18.0%)</td>
</tr>
</tbody>
</table>

Note: By study group, there was a statistically significant difference within the control group (only) at the \( P < 0.05 \) level. Within study groups, the response rate difference was statistically significant at the \( P < 0.001 \) level. 1Individuals <75 years of age were more likely to respond to the survey than those age 75 and older; this difference was statistically significant at the \( P < 0.0001 \) level. 2No significant difference in age or financial risk categories and association with nonresponse. 3These individuals were more likely than those with heart failure only to respond to the survey; this difference was statistically significant at the \( P < 0.05 \) level. 4As very few individuals had low financial risk, moderate- and low-risk categories were combined.

As noted, all participants were telephoned to complete a survey; 480 of these individuals completed the telephone survey and provided valid results. The overall response rate was 20%, far below the expected 50% response rate. The reasons for the lower than expected response rates were many. A high percentage of individuals never answered the telephone. In addition, almost 25% of individuals in the survey were reached but refused to participate. The response rates were not markedly different by study wave or group.
heart failure only. The control group seemed to have a particular nonresponse difference by comorbidity status; the intervention group response rates were similar by comorbidity status. No statistically significant differences in response rate by financial risk category were observed.

To support the bivariate analysis, both the main and interaction effects of the demographic characteristics were tested using a logistic regression model with nonresponse (responded = 0) as the outcome. The only variables with measured statistically significant effects were age category alone ($P < 0.0001$) and age category in interaction with comorbidity status ($P = 0.05$).19

In order to assess whether nonresponse within these characteristics would affect our findings, we tested the primary outcome by age category, comorbidity status, and age category in interaction with comorbidity status. Differences were minimal and not statistically significant. Results of logistic regression are not shown but are available upon request. We also thoroughly assessed the potential correlation with receipt of the DVD/booklet and subsequent levels of participation in services provided to support these members. Differences in the control and intervention groups on subsequent levels of health coaching support were minimal and not statistically significant. Further, we assessed whether survey response was correlated with heightened levels of participation in other support services. Differences between respondents and non-respondents on subsequent levels of health coaching support were minimal and not statistically significant.

Although the effect of differential nonresponse on these variables on the primary outcome was minimal, we adjusted for age category and comorbidity status by performing a weighting adjustment, using the probability method.20,21 This adjustment modifies the outcome variable by weighting respondent cells, using the combination of age category and comorbidity status as reference, by the ratio of targeted sample size to the actual sample size. This resulted in 4 adjustment categories (younger than age 75 and comorbid; younger than age 75 and not comorbid; older than age 75 and comorbid; and older than age 75 and not comorbid).

Both weighted and unweighted results for this measure are presented.

Primary outcome

Daily weight monitoring. Individuals in the intervention group (those who received the DVD and booklet) were more likely to report daily weight monitoring than individuals in the control group. About 44% of survey respondents in the intervention group reported weighing themselves every day in comparison to only 37% of control group respondents (Table 5). This difference was statistically significant ($P = 0.05$). The age- and comorbidity-adjusted rates (intervention 42%; control group 38%) also were statistically significantly different ($P = 0.03$); 67% of the intervention group reported that they weighed themselves either every day or most days; the control group's rate was 57% ($P = 0.05$).

Secondary outcomes

Differences between the two groups with respect to secondary outcomes were not statistically significant. Yet, the direction of the differences was in favor of the intervention group.

Self-care. As shown in Table 5, a total of 47% of the intervention group responded that they monitor their fluid intake every day or on most days versus 44% of those in the control group ($P = 0.57$). Similarly, the intervention group was more likely to report following a low-sodium diet every day or on most days as compared to the control group (83% versus 77%); this difference was not significant ($P = 0.14$). Thirty-eight percent of the intervention group reported engaging in physical activity every day or on most days; comparably, 40% of the control group participated in physical activity every day or on most days ($P = 0.80$).

Health status. Mean PCSs were similar for individuals in the intervention group (36.9) compared to the control group (36.1); this difference was not statistically significant ($P = 0.20$). Although the mean MCS for the control group was slightly higher than for the intervention group (50.7 versus 36.1, respectively), the difference between the 2 study groups was not significant ($P = 0.15$). Mean PCS and MCS scores suggest that physical and mental functioning levels are similar for the intervention and control groups.

Health care cost and utilization. Because of sample limitations, the study was not powered to detect reasonable differences in medical costs or utilization. Nonetheless, given the critical focus on costs and utilization associated with any intervention for individuals with heart failure, we conducted analysis of medical costs for all study participants as described. There were no statistically significant differences in any claims-based cost measures (claims incurred on dates up to 6 months postintervention).

Table 5. Self-Care Behavior by Study Group

<table>
<thead>
<tr>
<th>Self-care behavior n (%)</th>
<th>Intervention group</th>
<th>Control group</th>
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<tr>
<td></td>
<td>Every day</td>
<td>Most days</td>
</tr>
<tr>
<td>Weigh yourself</td>
<td>83 (43.7%)</td>
<td>44 (23.2%)</td>
</tr>
<tr>
<td>Monitor fluid intake</td>
<td>71 (37.6%)</td>
<td>18 (9.5%)</td>
</tr>
<tr>
<td>Follow a low-sodium diet</td>
<td>119 (62.6%)</td>
<td>39 (20.5%)</td>
</tr>
<tr>
<td>Engage in physical activity</td>
<td>39 (20.6%)</td>
<td>33 (17.5%)</td>
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*Difference from control group comparison was significant ($P \leq 0.05$).
booklet program with a doctor or health professional, about half (47%) intend to discuss the *Living with Heart Failure* program in the future.

**Living with Heart Failure** program satisfaction. Fourteen percent of intervention survey respondents reported that they did not have a DVD player when asked if they watched the *Living with Heart Failure* DVD. Study participants who reported that they watched the program were asked to rate the DVD and booklet using a 5-category (Likert) scale: excellent, very good, good, fair, or poor. A total of 108 individuals in the intervention group provided satisfaction ratings for the DVD, booklet, or both. Of those who used either material, 25% rated one or both of the materials as excellent, 45% very good, and 23% good (Table 6).

**Discussion**

This study examines the impact of a medical decision aid on important lifestyle factors for individuals with heart failure who are older than 64 years of age. Overall, our findings demonstrate that additional noninvasive outreach, which included the medical decision aid *Living with Heart Failure* DVD and accompanying booklet, positively impacted a critical self-care behavior. Rates of daily weight monitoring are significantly higher for individuals who received the *Living with Heart Failure* DVD and booklet than for those who did not. Other self-care behavior differences were not statistically significant; however, reasonably large differences were measured. Physical and mental health status, as measured by the SF-12 health survey, were similar between the groups. There were no differences in medical cost and hospital admission rates between groups prior to or following the intervention period; as mentioned, the study was not powered to detect reasonable differences in medical costs.

Among those in the intervention group, high proportions of individuals seemed appropriately attuned to the need to discuss the materials with their health care providers. This intent should enable other, more difficult health behavior changes to happen; it also may make the changes resultant from the materials more routine. Most recipients reacted positively to the *Living with Heart Failure* materials, although these satisfaction ratings were much lower than was expected, given our experiences with similar materials for other conditions.

A recent Cochrane review concluded that decision aids help to facilitate active participation, thereby leading to improved, value-based health care decisions.22 However, the effect size varied among the 55 randomized controlled studies that were reviewed. Several studies have been conducted to assess the impact of various types of disease management programs on outcomes for heart failure.4,23,24 The demonstrated impact of video education on self-care behaviors is limited. According to the findings of Albert et al,25 video education encourages self-care behavior adherence; these findings were consistent with the current study. Despite these findings, there remains a need for further research regarding appropriate approaches to improve heart failure self-care; moreover, research is needed to determine the direct effect of self-care on clinical and cost outcomes.26

A review of 11 small-scale randomized trials of disease management programs for heart failure concluded that a multidisciplinary team approach, with an emphasis on patient education, is most effective at reducing hospitalizations and lowering medical costs.27 Although this approach has been proven to improve outcomes for patients with heart failure, clinic- or in person-based education is a costly solution.

Patient decision aids in DVD format are a more economical form of disease management delivery compared to in person, clinician-led programs. According to 3 studies published between 1995 and 1999, the average cost of a multidisciplinary intervention for heart failure ranged from $208 to $350 per patient.28–30 Delivering a DVD and booklet to each individual is far less costly per individual and puts a lasting source of effective evidence-based information directly in the hands of individuals. The cost of developing, producing, and mailing such materials typically ranges between $20 and $50 per person, depending on the scope of the development effort and the volume of distribution. However, despite the marginal impact our decision aid had on improving self-care behaviors, decision aids alone are unlikely to match the impact a comprehensive support program (that employs telephonic care management and/or in person clinical support) would have on preventing hospital admissions or otherwise improving broader measures of quality for individuals with heart failure.

Therefore, the promise for decision aids of this sort is as a broad-based, relatively inexpensive support mechanism and as a tool for more personalized support processes for lasting retention of key messages. Of particular interest is exploring whether decision aids of this sort should be used in the context of the patient-centered medical home and accountable care organization models in which providers have more explicit responsibility for population health.

The following study limitations should be considered when interpreting these results. First, the original study protocol was structured to include a sample size of 3200 Medicare Advantage health plan members with heart failure; however, this population had fewer individuals who met the study criteria. The protocol also anticipated that 50% of these individuals would provide valid survey responses. At this level of participation, there would have been sufficient power (power = 0.8, alpha = 0.05) to detect differences of 5 or more percentage points on the key outcome measure (percentage of individuals monitoring weight on a daily basis) between the control and intervention groups. Much lower than expected response rates, in combination with anticipated higher eligibility, significantly reduced the power of

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**Table 6. Program Satisfaction (Intervention Group Only)**

<table>
<thead>
<tr>
<th>Response</th>
<th>DVD</th>
<th>Booklet</th>
<th>Either (highest rating)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>13</td>
<td>21 (21.7%)</td>
<td>27 (25.0%)</td>
</tr>
<tr>
<td>Very Good</td>
<td>15</td>
<td>46 (47.4%)</td>
<td>49 (45.0%)</td>
</tr>
<tr>
<td>Good</td>
<td>21</td>
<td>24 (24.7%)</td>
<td>25 (23.0%)</td>
</tr>
<tr>
<td>Fair</td>
<td>1</td>
<td>5 (5.2%)</td>
<td>6 (6.0%)</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>1 (1.0%)</td>
<td>1 (1.0%)</td>
</tr>
<tr>
<td>Total respondents</td>
<td>50</td>
<td>97</td>
<td>108</td>
</tr>
</tbody>
</table>
the study in comparison to the original design. Additionally, experience with other similar decision aid materials has involved a clinician (a health coach) introducing and sending the material after a telephone consultation. Receipt of materials without introduction, particularly educational materials intended to drive self-care behavior changes, will be less likely to please the recipient. Although this may have dampened the effect on the impact of the program in comparison to other delivery mechanisms, the approach to broad distribution of the materials enables much greater spread. Therefore, given the delivery mechanism, we are generally pleased with the level of positive response about the materials.

It is unclear whether the observed results are generalizable to non-seniors. Seniors could be more or less responsive to self-directed educational materials and could be more or less interested and able to use the materials in the formats delivered. Although this is clearly a promising approach that seems to have relevance to all individuals with heart failure, it would not be appropriate to assume that the same rate of improvement in self-care skills would occur in non-seniors.

The Living with Heart Failure DVD and booklet program increased levels of active weight monitoring and encouraged other important and fundamental self-care behaviors within 4 to 6 weeks of receiving the program. Medical decision aids in the form of DVDs, VHS tapes, or Internet programs are low-cost interventions that can be broadly distributed and may help to facilitate important self-care behaviors; however, significant improvements in self-care behaviors for individuals with heart failure may warrant a more intense disease management approach.

Acknowledgment

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Author Disclosure Statement

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References


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(Appendix follows →)
Appendix A: Heart Failure Fact Sheet

Working Together to Find the Best Treatment for Heart Failure

Get a flu and pneumonia shot.

When you or someone in your family has heart failure, getting the flu or certain infections can cause serious health problems, even death. Ask a doctor about a flu shot each year and ask whether a pneumonia shot is needed.

Know your medicines.

Talk with a doctor about the medicines. Be sure you know:

- The name of all your medicines.
- What the medicines are for.
- How to take them and how often.
- Possible side effects.
- When to call the doctor.

Ask a doctor about taking ACE inhibitors, beta blockers, and a heart diuretic (aldosterone antagonists). If there are problems with the medicines, talk with a Health Coach and a doctor.

Know the symptoms: Have a plan.

You need to know the warning signs that heart failure is getting worse and what to do if it does. Warning signs can include weight gain, increased trouble with breathing or increased swelling in your legs or belly. Talk with a Health Coach and a doctor about your plan. It may save your life.

Weigh yourself every day.

Weight gain may be a sign that heart failure is getting worse. If the gain is 2 pounds or more in a day or 5 pounds or more in a week, follow the plan for what to do when symptoms get worse.

Cut way back on salt (sodium).

Salt will make you hold onto water and this can make heart failure worse. Salt in food is also called sodium. There’s lots of it in processed foods such as canned soup and vegetables, frozen meals, fast foods, ham and bacon, cold cuts and hot dogs, and anything pickled. If you eat out a lot, you’re probably getting a lot of sodium in your food. Call a Health Coach for ways to cut back on salt.

Know your cholesterol and blood pressure numbers.

High cholesterol (fat in the blood) can mean big problems for people with heart failure. So can high blood pressure. Ask a doctor what the right numbers are to lower the chances of a heart attack.

Other health issues.

If you or someone in your family feels anxious or depressed, talk with a Health Coach and a doctor. They can help you make plans, take small steps, and start feeling better. It’s not always easy, but it’s worth it.

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This sheet is intended to be general information. Check with your doctor for information about your specific condition. If your need is urgent and you require immediate medical attention, contact your local 911 or emergency service, or go to the nearest emergency room.
Heart Failure Information Sheet