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Heart failure rehospitalization and delayed decision making: the impact of self-care and depression

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Abstract

Background—Rehospitalization soon after discharge can be distressing for persons with heart failure (HF) and place a heavy burden on the health care system.

Objective—We investigated and explored the association of self-care decision making variables with (1) rehospitalization within 30 days of discharge and (2) delay in seeking medical assistance (delayed decision making).

Methods—A cross-sectional, explanatory sequential mixed methods design [Quan>qual] was used to survey 127 hospitalized heart failure patients and interview fifteen of these participants to explain their survey responses. The survey assessed rehospitalization within 30 days of discharge, delayed decision making, HF self-care, and psychosocial factors influencing self-care.

Results—The likelihood of delaying the decision to be hospitalized was more than 5 times higher among those with high depressive symptoms (OR= 5.33, 95% CI: 2.14 – 13.28). Those who delayed going to the hospital were uncertain about their prognosis and did not feel their symptoms were urgent. The likelihood of being rehospitalized within 30 days was more than doubled among those with high depressive symptoms (OR= 2.31, 95% CI: 1.01 – 5.31). Those who were rehospitalized within 30 days were less likely to consult health care professionals in their decision making and wanted immediate relief from their symptoms.

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Conclusions—We recommend a patient-centered approach to help HF patients identify and adequately self-manage symptoms. The strong association between high depressive symptoms and rehospitalization within 30 days as well as delayed decision making highlights the critical need for clinicians to carefully assess and address depression among HF patients.

Keywords

heart failure; health outcomes; self-management; mixed method; readmission

Introduction/Background

Rehospitalizations among patients with heart failure (HF patients) are common due to a HF trajectory marked by sudden, acute exacerbations of illness.¹ Approximately 20% of HF patients with Medicare are rehospitalized within 30 days of discharge,² contributing to the 30.7 billion dollars spent on HF annually.³ With the aging baby boomer population, the costs are expected to rapidly increase in the future.⁴

Current hospitalization prediction models for HF use patient characteristics (e.g., age, race, comorbidities) and do not consistently or strongly predict rehospitalization,^{5,6} suggesting the need to explore other factors on how patients make self-care decision making. According to the Situation-Specific Theory of Heart Failure Self-Care, self-care is defined as a naturalistic decision making process in which individuals take actions to maintain physiological stability, facilitate perception of symptoms, and manage symptoms.⁷ Help-seeking is a form of self-care behavior; a timely decision to seek help may prevent further worsening of symptoms and hospitalizations.^{8,9} Despite its potential key role in HF outcomes, the HF self-care decision making process prior to rehospitalization is not well understood.

The goal of this study was to understand the influence of modifiable psychosocial variables on 30 day rehospitalizations and delayed decision making, using a sequential mixed methods design.¹⁰ Using a survey, we investigated if HF self-care and other selected study variables were predictors of delayed decision making and 30-day rehospitalization. Using qualitative in-depth individual interviews, we explored how the HF self-care decision making process influenced rehospitalization in HF patients who had been rehospitalized within and beyond 30 days of their last hospitalization. By combining survey data with open-ended interview data from patients, we sought a more complete picture of the factors influencing decision delay and rehospitalization of HF patients.

Methods

Design/Sample

We used a cross-sectional, explanatory sequential mixed methods design [Quan>qual].¹⁰ This design allowed an in-depth understanding of decision making by using the qualitative data to further explore the quantitative results.¹¹ Participants were recruited from an urban, East Coast, teaching hospital. We included English speaking HF patients who had a previous diagnosis of HF, previous hospitalization for HF, and were cognitively intact (Mini-CogTM score > 3). We excluded individuals hospitalized for acute conditions, with congenital heart

disease, with left ventricular assistive device (LVADS), and/or on dialysis. The final survey sample included 127 participants, after removing 59 participants due to cognitive impairment, screening errors, or voluntary withdrawal. From the survey sample, a purposive sample of 15 HF patients was selected based on 30-day rehospitalization status (yes/no) and self-care maintenance scores (high/low) to ensure multiple perspectives about self-care decision making would be represented. Participants in the purposive sample completed individual in-depth semi-structured interviews.

Procedures

The study was approved by the Institutional Review Board. Trained study staff screened inpatient medical charts, and approached/informed eligible patients about the study. Thirty day rehospitalization status was determined by medical chart review and/or by patient self-report of the last time he/she was hospitalized. Interested patients were consented before being screened for cognitive impairment using the Mini-Cog™ test.¹² Patients scoring over a 3 on the Mini-Cog™ proceeded to the web-based survey (<http://www.qualtrics.com>). All the survey questions, except the health literacy questions, were read to the participants by a trained research assistant. No incentives were given for completing the survey.

At the completion of the study survey, a select group of HF patients were approached to participate in an individual interview. Interviews were audio recorded if permitted by participants (n=13), and transcribed verbatim. Interviews were an average of 60 minutes long; participants received ten dollars for participation. Both the survey and interview portions of the study were completed within the same hospitalization visit in the participant's hospital room.

Sample size

For the quantitative sample, an a-priori power analysis based on analysis of covariance (ANCOVA) with two groups, alpha of 0.05, power of 0.8, and a medium effect size of 0.25 yielded a sample size of 128 participants. However due to the non-normal distributions of the variables, logistic regressions were used. For the qualitative sample, interviews were conducted until data saturation was reached.

Measurement

A study survey was developed to collect socio-demographics and medical history. We used the Situation-Specific Theory of Heart Failure Self-Care⁷ (Figure 1) to select relevant concepts pertaining to the person (HF knowledge - DHFKS,¹³ health literacy - S-TOFHLA,¹⁴ depressive symptoms - CESD-10,^{15,16,17} and Decision Regret scale^{21,22}) and the environment (social support - MOS,¹⁸). These concepts are hypothesized to influence HF self-care (SCHFI^{19,20}), decision delay, and hospitalizations. All study measurements have previously established reliability and validity.^{13–22} Medical variables such as New York Heart Association (NYHA) Class and Charleston Comorbidity Index were determined via self-report. Thirty day rehospitalization status was determined by participant self-report and medical chart review and decision delay was assessed via self-report.⁸ The two day cut off

for decision delay was determined through consultations with heart failure educators, nurses, and physicians as a clinically significant wait time. See Table 1 for measurement details.

Data Analysis

Of 127 participants who completed the study survey, four people had missing data on one or more study variables. Missing data²³ were imputed using multiple regression imputation.²³ Our analytic approach consisted of three phases. In phase one, descriptive statistics, t-tests, and; Chi-squared (or Fisher's exact as appropriate) tests were used to summarize data and compare participants. Variables significant at the bivariate level ($p < 0.10$) were included as covariates in the final models. Backward stepwise logistic regression was used to identify covariates for best fitting logistic regression models to predict 30 day rehospitalization status. The HF self-care subscales were included as covariates in both of the logistic regressions for theoretical reasons regardless of statistical significance at the bivariate level.^{24,25} The covariates were categorized as follows: (1) HF self-care maintenance: 1= high, 0=low, (2) HF self-care management: 1= high, 0=low, (3) HF self-care confidence: 1= high, 0= low, (4) social support, (5) NYHA class: 1= Class III and IV, 0 = Class I and II, (6) depressive symptoms: high=1, low=0, (7) education level: 1= more than high school education, 0=less than high school education, (8) employment: 1=employed, 0=unemployed, and (9) shortness of breath as the self-identified cause for hospitalization: 1=shortness of breath, 0=other symptom.

In phase two, we used a qualitative, descriptive analysis approach to group similar codes into categories.^{26,27} Throughout this process, we compared the codes with the interview transcripts, reflexively and continuously reviewing the codes and codebook with the study team. Researchers who coded had a varied background in heart failure, cancer, and nonclinical research to offer multiple interpretations. In phase three, congruence between the quantitative findings and qualitative data were placed in mutual context through data matrices constructed to compare and contrast participants.²⁸ These displays allowed us to examine the qualitative interview data and how it aligned with results from the quantitative survey data.

Results

Sample characteristics

Table 2 summarizes the survey sample characteristics. Average self-care scores indicated low self-care in all of the subscales. Of 127 participants, 125 were used for the delay in decision making analysis. Two participants were excluded because they were unable to quantify the number of days spent with worsening HF symptoms prior to rehospitalization.

Demographics of the quantitative and qualitative samples were similar. In the qualitative sample, 53% ($n=8$) were hospitalized within 30 days of their last hospitalization, 67% ($n=10$) had delayed decision making, 60% ($n=9$) had high self-care management scores, 80% ($n=12$) had high depressive symptoms and 42.5% ($n=54$) had shortness of breath before being hospitalized.

Factors influencing rehospitalization & delays in decision making

The odds of being rehospitalized within 30 days was 53% lower among HF patients with high HF self-care management (OR= 0.47) but did not reach statistical significance. The odds of 30 day rehospitalization was 2.3 times higher among those with high depressive symptoms (OR=2.31). Depressive symptoms were also significantly associated with delays in decision making with 5.3 times higher odds of decision delay among those with higher depressive symptoms (OR= 5.33). Shortness of breath was another significant covariate that affected delays in decision making but decreased the odds by 80% (OR= 0.20). Table 3 includes details on the odds ratios and model covariates.

Linking patient perspectives to statistical data

Tables 4 uses exemplary participant quotes to highlight differences in patient self-care decisions according to: (1) participant's self-care maintenance scores, (2) depressive symptoms, and (3) 30 day rehospitalization status.

Self-Care and 30 Day Rehospitalization—Participants who were rehospitalized within 30 days were unsure of how to respond to symptom exacerbations and did not seek advice from a health care provider before making decisions. Those with high self-care scores relied on previous experiences and/or suggestions from friends and family to self-doctor rather than seeking help from a health care professional: "I knew from past experience that if I was retaining too much fluid they would increase my Lasix, which I did." Meanwhile, those with low self-care scores exhibited uncertainty in how to respond.

Participants who were rehospitalized beyond 30 days with high self-care management scores tended to be proactive in seeking outpatient care and actively sought professional advice before making decisions. Those who contacted their outpatient doctors for help reported having an established relationship with their doctors prior to the symptom exacerbation. Conversely, participants in the rehospitalization category who had low self-care management waited for symptoms to worsen before seeking immediate help as exemplified by this quote: "I thought I was just sick so I took a hot bath, got out of the bathtub, I'm not feeling right,... so I got dressed...to go to the hospital."

Depressive Symptoms and 30 Day Rehospitalization—Individuals who had high depressive symptoms were more aware of their poor prognosis with HF and described their HF as a condition that was out of their control: "I just know that my condition is getting worse and that there's only so much I can do about it." Perspectives on their poor prognosis differed by 30 day rehospitalization status. Those who were rehospitalized within 30 days expressed their understanding that death was approaching but wanted immediate relief from their symptoms. One man characterized the urgency he experienced: "It's [adjusting medication per doctor's advice] going to take too long ... I don't have that kind of time because this is like you're laying some bacteria in the dish and waiting for it to mold and do different things, you know? I've got to have something done now." Participants who were rehospitalized beyond 30 days described feeling hopeless about their life with HF: "I'm not getting enough push to get anything accomplished. So, I just feel hopeless. I don't know

what I can do... I think I'll probably just walk and then keel over on whatever I'm walking on. It's that death thing that's out there."

In contrast to participants with high depressive symptoms, participants with low depressive symptoms did not want to think about the future and maintained a hopeful outlook on life. For example, a participant stated his future health was not likely to change as long as he continued to follow his doctor's orders.

Depressive symptoms, Symptoms Prior to Hospitalization, and Decision

Delay—Table 5 displays quotes related to depressive symptoms and symptoms prior to hospitalization (shortness of breath or other symptoms) by decision delay. Participants who did not delay the decision to go to the hospital expressed a strong will to live and believed the hospitalization would help relieve their symptoms based on past experience. They described their shortness of breath exacerbation as a state of panic: "it's like to the point where I'm scared I'm getting ready to die." In comparison, those who delayed making hospitalization decisions tended to describe their symptoms in less urgent terms and also expressed a sense of devastation and uncertainty about their future with HF. An individual described his despair: "...if I'm gonna feel like this every day of my life-like I'm hungover, I've got the flu, and I'm dying, you know nobody can fix me-what's the sense of being here... my body is screaming in agony."

Discussion

Integrating the quantitative data and the qualitative interviews revealed that persons who were rehospitalized within 30 days described different self-care decision making characteristics than those who were not rehospitalized within 30 days. Although the relationship between HF self-care and 30 day rehospitalization was not statistically significant--participants who were rehospitalized within 30 days attempted to alleviate symptoms through self-doctoring and/or relying on past experience or advice from family/friends. Participants who had high self-care scores and were not hospitalized within 30 days exhibited a clear pattern of behavior characterized by being proactive in seeking outpatient medical attention from health care providers with whom they had established relationships. Prior research indicates that responsive clinicians who show an interest in the patient's individual needs and share information promotes HF patient self-care.²⁹ Our findings highlight the importance of having a trusting and positive relationship between HF patients and outpatient health care providers as well as the benefits of enabling and encouraging patients to contact providers in times of need.

One explanation for lack of significant association between HF self-care and 30 day rehospitalization may be that HF patient self-care may have been a reflection of the participant's management ability in conjunction with their caregiver, rather than the patient's independent self-care abilities. While existing HF self-care assessment tools (e.g., SCHFI) address the patient's self-care alone and do not consider the involvement of caregivers, in-depth interviews revealed that participants heavily depended on family caregivers for assistance with HF self-care and making self-care decisions. Studies have reported the importance of caregivers in assisting with HF self-care such as motivating HF patients to

improve their self-care and navigating the health care system,³⁰ although the extent to which caregiver HF management skills influence patient outcomes (e.g., 30 day rehospitalization) remains unknown. In 2013, the Caregiver Contribution to Self-care of Heart Failure Index (CC-SCHFI) instrument was developed and tested for validity and reliability.³¹ This tool has good psychometric properties and could be used in future studies to understand the potential influence of family caregiver's HF management skills on rehospitalization. Our findings underscore the importance of incorporating caregiver involvement in assessing HF self-care decisions.

The presence of high depressive symptoms significantly increased the likelihood of delayed decision making and 30 day rehospitalization. In our sample, participants may have had an increased risk for depression due to the high unemployment rates.³² Past studies have also found depression increases the risk of hospitalizations among HF patients.^{33,34} The finding suggests the need for active screening and management of depressive symptoms among HF patients as part of routine care. Our mixed methods design allowed us to better understand why high depressive symptoms may have influenced 30 day rehospitalization and delays in making hospitalization decisions. In particular, the finding that participants felt disappointment with their body's inability to prevent symptoms from worsening and hopelessness about their future highlights challenges in coping with HF prognosis. Thus, HF patients may benefit from services (i.e., palliative care) which address emotional distress and improve coping techniques. Studies incorporating palliative care into HF patient care have demonstrated improvements in quality of life and symptom burden.^{35,36} Additionally, HF patients receiving palliative care have been shown to experience decreased hospitalizations.^{37,38}

Consistent with the existing literature,³⁹ we found patients with shortness of breath were more likely to act on their symptoms and not delay hospitalization decisions. Meanwhile, patients who identified other symptoms such as changes in functional status were more likely to delay making hospitalization decisions. These delays in decisions were likely due to difficulties in interpreting and understanding how to respond to symptoms, which were less worrisome or distressing than shortness of breath.⁴⁰ Findings draw attention to the need for developing strategies with HF patients to identify and adequately manage symptoms other than shortness of breath. Telehealth programs may be especially useful in helping clinicians closely monitor the progression of symptoms with HF patients and problem solve in real time.⁴¹ Helping patients to identify and manage a variety of symptoms could also be accomplished in specialized heart failure outpatient clinics that carefully monitors the health of recently hospitalized HF patients to prevent 30 day rehospitalizations.⁴²

Limitations and Strengths

Limitations of this research include the small sample size, potential for self-report biases, and generalizability. Our post-hoc power analysis indicated that the small survey sample may have increased the likelihood of a Type 1 error. Although the study results should be interpreted with caution, the large odds ratios suggest clinical significance. Nevertheless, we had a diverse sample with approximately half being African American. During the

quantitative survey, we decreased social desirability bias by reminding participants that we were interested in their personal experience and there were no correct answers.

We were also limited in our ability to determine if decision delays and hospitalizations were appropriate courses of action or inappropriate. It is possible that participants delayed going to the hospital because they were advised to self-manage at home and/or advised to be hospitalized by an outpatient health care provider. Unfortunately we could not discern the exact recommendations participants received from their outpatient providers because our participants were often moving between health systems for care resulting in incomplete medical charts. Applying a mixed methods design allowed us to illuminate the quantitative results with the qualitative data among the same participants. The qualitative data provided a salient context for the participant's quantitative scores, resulting in a richer and deeper understanding of why depressive symptoms and shortness of breath were significant predictors of our main outcome variables.

Conclusion

HF self-care, depressive symptoms, and shortness of breath influenced participant's 30 day rehospitalization status and delayed decision making. A patient-centered approach is required to help HF patients improve their self-management in areas they identify as challenging and to ensure adequate identification and management of symptoms other than shortness of breath as well as subsequent decision making. The strong influence of depressive symptoms on the likelihood of delayed decision making emphasizes the critical need for clinicians to carefully assess and address depression among HF patients as part of routine care.

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Figure 1.
Situation-Specific Theory of HF Self-Care

Table 1

Measurements

Instrument	What it measures	Score range	Notable Cut Offs
Dutch HF Knowledge Scale (DHFKS) ¹³	general HF, symptom, and treatment knowledge	0–15	--
short form Test of Functional Health Literacy (S-TOFHLA) ^{* 14}	2 subscales: (1) functional health literacy/reading ability, and (2) numeracy/ability to interpret numbers	0–36 for functional health literacy 0–8 for numeracy	23 on the functional health literacy scale indicates adequate health literacy
Center for Epidemiologic Studies (CESD)-10 ^{15,16,17}	depressive symptoms within the last week	0–30	10 scores is a possible indication of significant depressive symptomatology
Medical Outcomes Study (MOS) Social Support Scale-Short Version ¹⁸	emotional and tangible support	0–100	--
Self-Care of Heart Failure Index (SCHFI) version 6 ^{19,20}	3 subscales: (1) management – response to symptoms, (2) maintenance – performing daily HF specific activities to maintain health, and (3) confidence – amount of self-efficacy patients have in caring for their HF	0–100 for each subscale	70 indicates adequate self-care
Decision Regret scale ^{21,22}	reflect on the decisions they made before coming to the hospital	0–100	--
Delayed decision making	Time from initial recognition of worsening HF symptoms to hospitalization	--	Decision delay = waiting for more than two days (coded as 1) No decision delay = waiting for less than or equal to two days (coded as 0)

* Numeracy items were originally developed for individuals with diabetes and adjusted to be relevant for individuals with cardiovascular disease

Table 2
Survey Sample Characteristics by 30 day rehospitalization status and 2 day delayed decision making reported as Mean±SD or % (n)

Characteristics	Total	30 day N=48	Non 30 day N=79	P-value	No delayed decision making N=57	Delayed decision making N=68	P-value
Sex (male)	65.4 (83)	64.6 (31)	65.8 (52)	0.89	63.2 (36)	67.6 (46)	0.60
Age (years)	58.1 ± 13.6	56.3 ± 12.8	59.3 ± 14.0	0.22	58.3 ± 14.6	58.1 ± 12.5	0.92
Race							
Caucasian	37.9 (47)	37.5 (18)	36.7 (29)	0.82 *	36.8 (21)	36.8 (25)	0.34
African American	59.7 (74)	56.2 (27)	59.5 (47)		61.4 (35)	55.9 (38)	
Other	4.8 (6)	6.2 (3)	3.8 (3)		1.8 (1)	7.4 (5)	
No. of Dependent (children/grandchildren)	1.4 ± 1.2	1.2 ± 1.1	1.5 ± 1.3	0.18	0.7 ± 1.3	0.5 ± 0.8	0.33
Caregiver in Residence							
Yes	52.8 (67)	52.1 (25)	53.2 (42)	0.91	49.1 (28)	55.9 (38)	0.45
Education							
HS education or less	48.8 (62)	37.4 (18)	55.7 (44)	0.05	54.4 (31)	44.1 (30)	0.25
Some College or more	51.2 (65)	62.5 (30)	44.3 (35)		45.6 (26)	55.9 (38)	
Marital Status							
Married/Living with Sig	40.2 (51)	43.8 (21)	38 (30)	0.45	42.1 (24)	38.2 (26)	0.72
Widowed/separated/divorced	33.9 (43)	27.1 (13)	38 (30)		29.8 (17)	36.8 (25)	
Never Married	26.0 (33)	29.2 (14)	24.1 (19)		28.1 (16)	25.0 (17)	
Employment Status							
Employed	21.3 (27)	16.7 (8)	24.1 (19)	0.32	28.1 (16)	16.2 (11)	
Unemployed	78.7 (100)	83.4 (40)	75.9 (60)		71.9 (41)	83.8 (57)	0.11
Annual Income							
0–20,000	44.4 (56)	50.0 (24)	41.0 (32)	0.71 *	47.4 (27)	41.8 (28)	0.51 ^a
20,001 – 60,000	32.5 (41)	27.1 (13)	35.9 (28)		31.6 (18)	32.8 (22)	
60,001 +	18.3 (23)	18.8 (9)	17.9 (14)		14.0 (8)	22.4 (15)	
don't know	4.8 (6)	4.2 (2)	5.1 (4)		7.0 (4)	3.0 (2)	
Time with heart failure (years)	6.5 ± 8.6	5.7 ± 7.4	7.0 ± 9.2	0.43	6.8 ± 10.8	6.3 ± 6.2	0.75
NYHA [†] Class							
I	18.9 (24)	14.6 (7)	21.5 (17)		24.6 (14)	14.7 (10)	

Characteristics	Total	30 day N=48	Non 30 day N=79	P-value	No delayed decision making N=57	Delayed decision making N=68	P-value
II	21.3 (27)	14.6 (7)	25.3 (20)	0.19	21.1 (12)	20.6 (14)	0.22
III	40.2 (51)	43.8 (21)	38.0 (30)		31.6 (18)	48.5 (33)	
IV	19.7 (25)	27.1 (13)	15.2 (12)		22.8 (13)	16.2 (11)	
Number of past hospitalizations for heart failure	3.8 ± 3.3	3.9 ± 2.8	3.7 ± 3.5	0.69	3.6 ± 2.9	3.9 ± 3.5	0.64
Charleston Comorbidity Index	2.7 ± 1.7	2.7 ± 1.4	2.8 ± 2.0	0.91	2.6 ± 1.6	2.8 ± 1.9	0.672
Self-Care							
Maintenance	64.2 ± 17.2	62.8 ± 18.1	65.1 ± 16.8	0.49	63.2 ± 19.4	64.8 ± 15.5	0.626
Management	63.6 ± 21.7	62.6 ± 21.1	64.1 ± 22.2	0.72	61.4 ± 23.2	65.4 ± 20.8	0.338
Confidence	60.6 ± 19.0	56.2 ± 19.6	63.0 ± 18.3	0.06	62.3 ± 20.3	59.6 ± 18.1	0.439
Delayed decision making (days)	16.1 ± 10.7	13.6 ± 23.5	17.5 ± 47.99	0.61	0.7 ± 0.8	29.0 ± 51.8	<0.001
Heart Failure Knowledge	10.3 ± 1.7	10.3 ± 1.9	10.2 ± 1.6	0.93	10.3 ± 1.7	10.3 ± 1.7	0.928
Decision Regret	11.2 ± 17.0	13.4 ± 22.0	9.8 ± 13.2	0.30	9.6 ± 17.1	12.5 ± 17.2	0.342
Depressive Symptoms	12.2 ± 7.0	13.9 ± 6.5	11.2 ± 7.1	0.03	10.2 ± 6.8	13.6 ± 6.7	0.005
Social Support	73.9 ± 26.1	68.3 ± 26.0	77.1 ± 25.8	0.07	74.8 ± 26.5	72.9 ± 26.3	0.694
Health Literacy							
Reading Comprehension	23.3 ± 9.8	24.1 ± 9.5	22.9 ± 10.0	0.50	22.6 ± 9.6	24.2 ± 10.0	0.378
Numeracy	5.9 ± 2.1	5.9 ± 2.0	5.8 ± 2.2	0.88	5.9 ± 2.0	5.9 ± 2.1	0.916

* Used Fisher's Exact test instead of Chi Squared test

[†] NYHA – New York Heart Association

Table 3

Factors Influencing Rehospitalization and Decision Delay

Influences on 30 Day Rehospitalization		
Factor	Odds Ratio (95% CI)*	P-value
Self-Care Management	0.47 (0.21 – 1.04)	0.063
Depressive Symptoms	2.31 (1.01 – 5.31)	0.049
Influences on Decision Delay		
Factor	Odds Ratio (95% CI)**	P-value
Depressive Symptoms	5.33 (2.13 – 13.28)	p<0.001
Shortness of breath	0.20 (0.08 – 0.49)	p<0.001

* model variables: SCHFI (self-care maintenance, self-care management, self-care confidence), MOS (social support), symptom severity (NYHA classification), CESD-10 (depressive symptoms), and education level

** model variables: SCHFI (self-care maintenance, self-care management, self-care confidence), number of dependents living at home, CESD-10 (depressive symptoms), employment, and shortness of breath

Table 4

Data Matrix of Quotes by 30 Day Rehospitalization Status

	Participants rehospitalized within 30 days	Participants rehospitalized beyond 30 days
High self-care management Scores (SCHFI[*] ≥ 70)	...the fluid was up into my hips and when I was taking the Lasix the fluid was going down. The fluid actually had got down to my knees, but once it got down to my knees, it wouldn't go no further and that's what made me say well, shoot, let me just go ahead and double up the pills [Lasix] <i>participant 232</i>	I had to start getting lung taps to release the fluid out of my lungs and I had three lung taps to the left and 3 lung taps to the right. <i>participant 246</i>
	I couldn't breathe and even when I sat down on the couch I couldn't get no relief...I think I tried the pillows, somebody told me to try the pillows... that was my sister-in-law or my wife or somebody <i>participant 203</i>	I noticed it [shortness of breath] because I was doing [a recreational drug]...then all of a sudden, something hit me and I didn't know exactly what it was. So, I called my doctor <i>participant 193</i>
Low self-care management Scores (SCHFI < 70)	...just didn't realize, I just wasn't thinking straight mentally. Uh, I just didn't realize that it [symptoms] was my heart. <i>participant 161</i>	A tightness in my chest which I'm known to get every time that I have, what I call one of the CHF attacks...What I call an attack is when my breathing gets to the point where I can't breathe, where I have dialed 911 and I couldn't tell them my address. <i>participant 151</i>
	Some time it led up where I'll be having problems breathing, but not really, you know that serious and I'll just chill with it and try to like, get myself together. <i>participant 240</i>	
High Depressive Symptoms(CESD-10 ≥ 10)	...just because I'm in heart failure doesn't mean I'm going to sit around and see how long it takes it to fail. If there's anything that can be done, you know, to help me, you know, then I'm going to try that. <i>participant 154</i>	I wanna be able to do what I used to do and do it better, but my body is saying no. That's the thing that's really humiliating and debilitating that you can't function like you used to, <i>participant 246</i>
Low Depressive Symptoms(CESD-10 < 10)		I asked Dr. C, as to how long it's gonna take me to completely recover..., and she said probably in about 2 years. <i>participant 192</i>

^{*} SCHFI – Self Care of Heart Failure Index

[†] CESD – Center for Epidemiologic Studies

Table 5

Data Matrix of Quotes by Delayed Decision Making Status

	Waiting <2 days	Waiting 2 days
Depressive Symptoms(CESD *-10 Score Range: 2–23)	I just gotta get my health together and get myself, you know. Ain't nobody gonna hire me if I start sweeping the floor and I gotta stop every two minutes to catch my breath...Or I, I call in sick cause I got chest pains. <i>participant 240</i>	Now, I talked to the doctors. They got mad at me. I said, I know you're experts in your field. I said, but I'm pretty sad, treating the fluid is a band aid, the root cause is the heart. <i>participant 246</i>
	If my chest starts hurting, or if I'm out of breath too much, I go to ER. That's the only place I feel safe that that if anything is wrong I could be treated. <i>participant 205</i>	... If I got to feel like this the rest of my life, I'd rather be dead you know... it ain't no way to live. You're not living, you're existing in pain and, and you're suffering. That's no way to live. <i>participant 233</i>
Symptoms Prior to Hospitalization[†]	[describing shortness of breath]...it's like a person drowning with like a weight around they feet and then trying to get out from under that water. <i>participant 240</i>	I'm like okay, maybe it's depression. Mom just died and her death anniversary was a week or two before. And I didn't know. As far as I know, my heart stents were good and I'm going to cardio rehab. <i>participant 161</i>
		[when asked how long symptoms lasted for] This was about, I think I'd say about a week altogether. But it wasn't that bad, it wasn't that bad, you know. I was like a little lightheaded but I was still moving, you know, light head, had a little pain, but nothing to worry about. <i>participant 203</i>

* CESD – Center for Epidemiologic Studies

[†] Symptoms prior to Hospitalization – defined as main reason for hospitalization via self-report; divided into two categories: shortness of breath and other