Mechanisms of change in self-care in adults with heart failure receiving a tailored, motivational interviewing intervention

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Abstract

Self-care is challenging but we previously demonstrated that motivational interviewing (MI) was effective in improving heart failure (HF) self-care.

Objective—To identify the mechanisms of intervention effectiveness by elucidating the MI techniques used and the relationship between the techniques and changes in self-care.

Methods—Audiotaped sessions (first and subsequent sessions) from 8 participants were transcribed verbatim and coded to evaluate changes in self-care. Using a sequential mixed method design, quantitative and qualitative self-care data were triangulated; congruence was 97%. The MI techniques used and mechanisms of intervention effectiveness were identified from the qualitative data.

Results—Three MI techniques used were related to improved self-care: 1) reflection and reframing, 2) genuine empathy, affirmation, and humor, and 2) individualized problem solving. These techniques stimulated openness to goal setting, positive self-talk, perceived ability to overcome barriers, and change talk. The mechanisms by which the techniques achieved the desired outcomes were the development of discrepancy and self-efficacy, which are consistent with the principles of MI.

Conclusion—This study contributes to clarifying the mechanism by which MI facilitates behavioral change.

Practice implications—Using MI to discuss self-care can help to overcome barriers and engage HF patients in goal setting for behavior change.

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Keywords

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1. Introduction

Self-care is challenging for individuals with complex chronic illnesses such as heart failure (HF) and diabetes. These illnesses require patients to follow a detailed treatment plan involving diet and medicines, monitor symptoms, interpret signs of a change in health, and collaborate with providers to access care before an emergency occurs [1]. We and others have demonstrated that poor self-care occurs for a variety of reasons [2,3]. When intentional factors are operant, motivational interviewing (MI) can improve the commitment to perform self-care [4].

MI utilizes empathetic understanding to increase motivation for and decrease resistance to behavioral change. Effective use of MI evokes and increases change talk, which refers to a person's own verbalization of his/her motivations for change. Sustain talk, ambivalence or resistance to change, is decreased with MI [5]. MI was developed in psychology and only recently has the approach been used in chronically ill patient populations. Studies among adults with HF have examined the effect of MI on exercise [6], hospital readmissions [7], self-care [8], and quality of life [9], revealing that MI is an effective approach for improving self-care and outcomes in this patient population. Unfortunately, little is known regarding the specific mechanisms through which MI influences HF self-care. Our pilot data revealed that effective MI in this population resulted from: an empathetic, reflective, and self-disclosing communication style; the ability of the interviewer to help people make self-care fit within their life situation, culture, and constraints; and by helping patients bridge the transition from hospital to home through education, practicing essential skills, and helping to access resources [10]. These pilot results were used to develop the intervention used in the present study.

We previously demonstrated the efficacy of a tailored MI intervention compared to usual care for improving self-care behaviors in a sample of adults with chronic HF [8,11]. Participants who received the intervention had significant and clinically meaningful improvements in HF self-care maintenance over 90 days that exceeded that of usual care. In this paper, we explore those results further by integrating qualitative data from a subset of participants with two or more intervention audiotapes. The aim of this study was to identify the mechanism of intervention effectiveness by elucidating the MI techniques used and the relationship between the techniques and changes in self-care. Combined with our prior pilot work, answering these aims will allow us to develop hypotheses about mechanisms of effectiveness, which can be tested in later studies.

2. Methods

The methods for the Motivational Interviewing Tailored Interventions for Heart Failure (MITI-HF) trial have been described previously [11]. In brief, a total of 41 participants received the tailored MI intervention. The intervention began with a home visit and

continued with 3–4 follow-up telephone calls over the next 90 days. During the home visit the registered nurse interventionist used an MI approach to help participants identify at least two goals that would improve their HF self-care. The intervention was tailored to these goals and specific self-care issues identified in the participant's baseline self-care data (e.g., exercise) collected using the Self-Care of HF Index [12]. Of the 41 participants who received the intervention, 20% (N = 8) had at least two of their intervention sessions audiotaped to assess intervention fidelity—one recorded on the first visit and one on a later visit, allowing us to assess change over time. These audiotapes were used in this analysis.

A sequential mixed methods design [13] was used in this study. There were two discrete phases of analysis; in the first phase we examined self-care change over time. The first author (BR) independently analyzed the quantitative data of the subset of the intervention participants used in this analysis (N = 8). She was blinded to the qualitative data. Also during this first phase, the second author (VVD), blinded to the quantitative data, independently analyzed the qualitative data to explore the narratives of self-care and describe changes in self-care over the 90-day intervention interval. Then the quantitative and qualitative data were triangulated to assess congruence of pre-post self-care and change in self-care over time.

In the second phase of the analysis, the qualitative data from audiotaped intervention sessions were analyzed to assess the mechanism of intervention effectiveness. The third author (LEG) independently reviewed the qualitative data and provided expert opinion on the MI techniques used and the effect on participants. Each of these steps is described in detail below.

2.1. Quantitative data collection and analysis

Self-care was measured with the Self-Care of HF Index (SCHFI) version 6.2. This version of the SCHFI includes 22 items designed to measure self-care maintenance and management as well as confidence in the ability to perform self-care. Self-care maintenance captures treatment adherence and monitoring behaviors. Self-care management reflects the response to symptoms when they occur and scores on this scale are calculated only in persons reporting symptoms. All three scales in the index are standardized individually to yield separate scores that range from 0 to 10 0. Higher scores indicate better self-care [12]. An improvement of 8 points on any SCHFI scale is judged as clinically meaningful. An important element of the self-care management scale is symptom recognition. A single item asks: "If you had trouble breathing or ankle swelling in the past month, how quickly did you recognize it as a symptom of heart failure?". Responses to this specific question range from 0 (I did not recognize it) to 4 (very quickly). This single item was examined in addition to the three SCHFI scales because symptom recognition was an element of the intervention.

Standard descriptive statistics were used to describe the characteristics of these 8 participants and changes in mean SCHFI scale scores (i.e., maintenance, management, confidence) over the 90-day intervention period. Individual improvement in each scale was judged using the 8 point criterion noted above [12]. Improvement in the single symptom recognition item was based on the numeric response (i.e., change from 2 to 3 judged as

improvement). All quantitative descriptive analyses were performed in SPSS v.23 (IBM, Armonk, New York).

2.2. Qualitative data collection and analysis

To assess self-care behavior change qualitatively in phase 1, transcripts from audiotaped intervention sessions were analyzed using Atlas.ti version 7.0 (Berlin, Germany). Each of the 8 individuals and their set of sessions constituted a "case". Preliminary analysis of intervention session transcripts entailed a line-by-line review that yielded clusters of data labeled into brief headings. Codes derived from these data reflected self-care and behavioral change over time. Evidence of new or improved self-care behavior (e.g., exercise) were judged as "improved". Conversely, reports of poorer self-care (e.g., diet or medication nonadherence) over time were judged as "declined". Self-care that did not change over time was labeled as "no change". The same process was used to describe qualitative evidence of changes in self-care maintenance, symptom recognition, self-care management, and self-care confidence.

To achieve the study aim, we analyzed the qualitative data of each transcribed intervention session for evidence of the MI techniques used by the nurse interventionist (e.g., reflection) and the effect on participants (e.g., change talk). The self-care codes derived using the process described above were linked to these intervention components and responses to provide descriptive evidence of intervention effectiveness. Finally, these coding categories were summarized across cases to yield mechanisms of action. Methodological rigor of the qualitative analysis was maintained through an audit trail, periodic debriefing with the research team, and consultation with an MI expert [14]. An audit trail of process and analytic memos was maintained to support the credibility of the analysis.

2.3. Integrated data analysis

Once all the quantitative and qualitative data had been analyzed, the lead investigators (BR & VVD) used triangulation methods [15] to assess congruence between the quantitative and qualitative pre-post evaluations of self-care for each case. This process produced an informational matrix [16] anchored by the self-care triangulated result (i.e., improved, declined, no change) in each of four specific categories: self-care maintenance, symptom recognition, self-care management, and self-care confidence. This matrix allowed us to judge congruence and then to explore the emergent qualitative themes about the MI intervention and the mechanism of intervention effectiveness. In cases where there was incongruence, the qualitative data were reexamined to explore reasons for the inconsistency between the objective (SCHFI data) and subjective (qualitative interview) data [15].

3. Results

3.1. Quantitative results: self-care change over time

Seventy individuals were randomized to the MI group and 41 completed follow-up [8]. These 41 were predominately men (63.4%), Caucasian (53.7%), educated at a high school level or less (68.3%), with a mean age of 60 ± 13.9 years. The subset of 8 participants included in this study were half female, 2 were in NYHA class II, 4 were in class III, and 2

were in class IV. Six participants self-identified as Black and 2 as White. Education was distributed throughout all levels with 50% educated at a high school level or less. The mean age of this subset was 57 ± 20.6 years. On average, these 8 individuals had 3.6 ± 1.8 (range 0–6) comorbid chronic illnesses in addition to HF. Scores on the SCHFI improved dramatically in the full intervention group (Table 1). In the subsample of 8, a similar picture was evident (self-care maintenance at baseline 52.1 ± 17.4 improved to 74.6 ± 9.6 at 90 days; self-care management 52.5 ± 14.9 improved to 68.1 ± 28.4; self-care confidence 57.9 ± 24.7 improved to 81.3 ± 21.2). Considering individual improvement in self-care, all except for one participant improved to some extent. Most improved in the areas of self-care maintenance and confidence. Only one person improved in all four areas.

3.2. Qualitative results: self-care change over time

The narrative accounts of self-care embedded in the intervention session audiotapes revealed that baseline self-care was poor in this sample and engagement in self-care at baseline varied among the specific behaviors. That is, participants described themselves as good in some areas of self-care and poor in others. In general, they described difficulty with dietary adherence ("*the hardest part is salt. …that little salt adds up … some days I just got to have my salt…* "), inconsistent symptom monitoring ("*I do not see no sense in doing that every day. I have noticed that you can lose in a day; and you can gain in a day …*."), a reluctance to manage symptoms that was described as "wait to see", and poor symptom awareness ("*I can't tell…. I guess alarms should be going off… but basically, I don't know …*").

Overall, the qualitative accounts of self-care improved over the course of the intervention with most participants describing improved self-care maintenance, particularly in the areas of dietary adherence ("*…I am taking more care and scrutiny … toward a proper diet… I'm doing much, much better … I know I am*") and symptom monitoring ("*yes, every day <weighs self> and I do not lie about my weight, 'cause they really have to know about the weight*"). In addition, there was improved symptom awareness (" *… now if my feet is swollen, I say, "I know that's what it is!"*) and symptom management ("*If my weight gets up over 165, then I take another diuretic …* ").

One participant qualitatively described a decline in symptom recognition over the course of the intervention. In this case, a lack of symptoms was reported at baseline but she was confident in the ability to recognize symptoms early and had a plan to take an extra diuretic (" *… my ankles are small…. I would see them if they swelled … and take the <water pill>*"). However, at a subsequent session with the nurse she reported that she had experienced some shortness of breath despite normal ankles but did not initially recognize this as a symptom of worsening HF. When she weighed herself a few days later, she noted an increase in 3 pounds, a new signal to her that she was retaining fluid. In this case although the individual expressed that "*it took a while … and … had to go to the hospital*"; she actually incorporated content from the intervention in assessing a change in weight as the explanation for her symptoms.

A secondary and important finding that emerged from the qualitative data was that there were substantial knowledge deficits in this population. In 6 of the 8 cases, much of the initial intervention session was spent reinforcing standard education about HF ("*I do want to know*

… it's my body…. I think why were my legs swollen and I felt tired … ") and describing the link between self-care and HF symptoms ("*water follows salt*").

3.3. Integrated results: self-care change over time

When the data were integrated for each case, congruence between the quantitative and qualitative data was 97%. That is, when the two types of data were compared for self-care maintenance, symptom recognition, self-care management and self-care confidence at pretest and posttest intervals, only 2 of the 64 cells (8 participants, 2 data types—quantitative and qualitative data, 4 self-care areas) failed to agree. When the pretest and posttest data were evaluated, there was 100% congruence in the quantitative and qualitative data in change over time in self-care maintenance, symptom recognition, management and confidence. See Table 2 for examples of integrated results of self-care change over time.

3.4. Motivational interviewing techniques

When the qualitative data were analyzed to describe which MI techniques were most effective and responses to MI techniques were explored, three themes emerged: 1) reflection and reframing facilitated positive-self talk and change talk, 2) a communication style that included genuine empathy, affirmation, and humor promoted perceived ability to overcome barriers, and 3) personalized problem solving stimulated openness to goal setting.

3.4.1. Theme 1: reflection and reframing facilitate positive self-talk and change talk—Reflection and reframing statements were effective in giving voice to the change process and success in behavioral change. Through reflective listening, the nurse was able to elicit individual arguments for engaging in specific self-care behaviors (" *… then in order to get to <goal> you know the exercises that you can start doing*"). Listening carefully and reframing statements within the context of a specific behavior and individually-identified barriers were important in motivating change. Reframing acknowledged the validity of the participant's view on a particular issue (e.g., difficulty with low salt diet) but offered new meaning within the context of HF self-care that allowed reflection on his/her own perspective, which often involved acknowledging lack of confidence. In subsequent sessions, reflections were used to elicit statements that supported self-efficacy with descriptions of the changes made and the barriers overcome. In effect, the use of reflection and reframing facilitated expressions of confidence in the ability to continue to engage in the targeted behavior despite real or potential future obstacles. For example, after working with an individual who had expressed numerous challenges to dietary adherence but who had improved over time, the nurse reflected (" *… you know where you have to go <to buy food> … it is a hassle to find those kinds of foods … you are able to drive to get the deals<food store> … it is really good that you are baking … and that you are eating fruits now. That is really good …*"). The individual responded, " *… and my Aunt likes to find the deals … so that helps with the finances…. Get my fruit and chicken … It is better, it is better.*"

Positive self-talk ("*I will say to myself… you need to do right as far as the food … you know what to eat…* ") was often found in response to the nurse's use of reflection. Participants discussed their self-efficacy and personal strengths that would allow them to be successful in self-care. In some cases, they discussed past successes (" *… in the past, I was*

able to get to the point that I could walk up to the corner, catch the bus downtown, walk around, get something to eat, come back home … "), which strengthened their motivation. Conversely, those who focused on barriers and challenges to self-care as insurmountable or past failures, seemed to be less receptive to behavioral change. Similarly, change talk was more common among those who had positive changes in self-care. These participants identified specific self-care behaviors and individualized strategies (e.g., self-monitoring strategies, adapting cultural food preferences to minimize salt) that they were willing to try.

3.4.2. Theme 2: communication style that included genuine empathy, affirmation, and humor promoted perceived ability to overcome barriers—

Another approach used by the nurse involved communication with empathy (" … *<remembering to weigh daily> is not the easiest thing. I can understand that…* "), affirmations (" … *it sounds like you know what your limits are …* ") and humor ("…*I don't want to jinx it …* "), which built rapport, facilitated engagement, and guided the individual's perceived ability to overcome barriers and set goals. Using these techniques, the nurse created an environment that conveyed support and acceptance of the person and his/her preferences and goals without conditions or judgment. Once barriers were identified, there seemed to be a natural progression towards goal settings.

Interestingly, in this study, those who improved in self-care were responsive to the MI techniques as evidenced by identification of barriers and recognition of perceived ability to overcome those barriers and receptive to setting goals related to specific self-care behaviors. The result was positive self-talk and change talk. The process of goal setting seemed to be linked to recognition of either a need ("…*I'm not the same person …* ") or potential benefit ("…*I gotta get it right cuz if I don't, I'm gonna be back in the hospital, and I don't want that*") related to self-care. Guided by responses on the Self-Care of HF Index, the nurse helped the individual see discrepancies in behavior, personal values (e.g., family, health), and goals. Through development of discrepancies, goals tailored to individual preferences were established. Conversely, in those who did not change behavior, there was a lack of responsiveness to the MI techniques. Only two participants were reluctant to set goals; as one individual politely declined " … *sounds like I'm back at work … they used to say 'what are your goals for this year' …* " These individuals did not make a notable change in self-care.

3.4.3. Theme 3: personalized problem solving stimulated openness to goal setting—

Personalized problem solving was another MI technique used commonly, especially in those who reported positive self-care changes. The nurse elicited goals based on narratives, cultural preferences, and social norms. For example, one man expressed his desire to be able to walk to religious services as he had done previously: "*In order for me to go to synagogue, since we don't drive on the Sabbath, my son has to push me in a wheelchair and I'm not happy about being in wheelchair, but I do want to get to synagogue.*" The nurse elicited barriers and challenges to exercise, keeping that personal goal in mind. Over the course of the intervention, the participant started a program of exercise that included riding a recumbent bike and arm strengthening exercises aimed at working toward his personal goal. Other examples of personalized problem solving included working with one participant who

wanted to be able to attend a grandchild's birthday party and another seeking the stamina to shop with friends.

4. Discussion and conclusion

4.1. Discussion

In this study we triangulated quantitative and qualitative self-care data to identify the mechanism of effectiveness of a tailored MI intervention. Three MI techniques used by the nurse interventionist were instrumental to success: 1) reflection and reframing, 2) genuine empathy, affirmation, and humor, and 3) personalized problem solving. These MI techniques stimulated openness to goal setting, positive self-talk, perceived ability to overcome barriers, and change talk. The mechanisms by which the MI techniques achieved the outcomes above were through the development of discrepancy and building self-efficacy. This study provides further support for MI as an effective method of improving self-care behaviors in chronically ill adults with HF.

A core skill of MI is developing discrepancy by helping people to recognize how current behavior differs from ideal behavior and broader life goals [17]. This discrepancy is thought to motivate behavioral change. Yet, it is also essential to show acceptance and unconditional support [18] even for "bad" behaviors (e.g., medication nonadherence, cheating on low salt diet). In this study, the communication style (empathy, affirmation, and humor) and the MI techniques of reflection and reframing helped participants identify discrepancies between their current behavior and their personal goals. These mechanisms reflect the MI approach [19] and are consistent with our prior study of mechanisms underlying a MI intervention for self-care [10]. In that study we also found a key theme of communication with reflective listening and empathy [10].

Another MI approach is to evoke solutions from the individual rather than demonstrating the provider's authority. In this way, MI affirms the person's autonomy to make informed choices. In this study, the effective use of goal setting elicited the individual's priorities, preferences and likely facilitated engagement, positive self-talk, and change talk. These results are similar to those of others who found that a variety of MI techniques supplemented and promoted goal setting and healthful eating in children [20]. In our prior study we found a similar mechanism of "making it fit" [10]. In that study the nurse interventionists acknowledged cultural beliefs, helped participants overcome barriers and constraints, and negotiated an action plan.

Developing self-efficacy is a key element of MI. In this intervention, improving self-efficacy required that participants identify obstacles to specific self-care behaviors, their ability to overcome the barriers (positive self-talk) and a feasible plan to accomplish the self-care goal (change talk). Reflection and reframing were the primary techniques used by the nurse to effectively support the development of self-efficacy by fostering optimism, helping to identify strengths, affirming small steps, and facilitating the expression of confidence in self-care ability. These results support those of others who have demonstrated that self-efficacy mediates the effect of MI on outcomes. For example, Chariyeva and colleagues [21] found that the dose of MI (intervention time and number of sessions) influenced risky sexual

behavior and this effect was mediated by self-efficacy but not by motivation to practice safer sex. Jones and colleagues [22] demonstrated that MI influenced exercise through its effect on efficacy expectations. Our results are consistent, adding to the evidence that MI is effective at improving self-efficacy as it relates to self-care of chronic illness, thereby influencing outcomes.

In our prior study we identified a mechanistic theme of bridging the transition from hospital to home by providing information, building skills, and activating support resources [10]. This theme was not identified in the current study even though these participants also were recruited from a hospital setting. One reason may be that the nurse made only one in-person visit; the rest of the intervention was done by telephone. This process could have limited the full potential impact of the intervention.

There were several limitations to our study. First, we studied a small and somewhat selective sample and only a small number of them had longitudinal qualitative data. Thus, there may be additional ways in which the intervention worked that were not captured. Since the intervention focused on patient priorities (e.g., diet versus exercise), not all self-care behaviors were discussed and thus not captured qualitatively. Some of the baseline sessions were conducted in the hospital, which may have influenced how receptive patients were to the MI approach compared to those who were already discharged when the nurse interventionist first contacted them. Finally, although we trained 2 nurse interventionists, all the tapes analyzed in this subset of the sample were from a single nurse. It is possible that interventionist demographic or interpersonal style characteristics influenced the intervention. The primary strength of the study is the use of a robust sequential mixed methods design that allowed us to integrate the data in this phase of analysis.

4.2. Conclusions

Despite the limitations noted above, these results support MI as an effective method of improving self-care behaviors in adults with chronic HF. The mechanisms by which the MI techniques achieved openness to goal setting, using positive self-talk, perceiving the ability to overcome barriers, and using change talk are all consistent with the principles of MI.

4.3. Practice implications

Preliminary skill in MI is easily attained and worth the effort of clinicians to learn because of its power in facilitating behavioral change. With this study we adds important information to the literature demonstrating the robustness of the method when used with chronically ill populations and the translatability to a variety of disciplines. Using MI to discuss self-care can help to overcome barriers and engage HF patients in goal setting for behavior change.

Acknowledgments

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Table 1

Change in Self-Care of Heart Failure Index Scores Over Time in the Intervention Group (N=41).

	Pretest	Posttest	P-value, Standardized Effect size
Self-Care Maintenance (n = 41)	59.9 ± 16.4	79.6 ± 11.4	P < 0.0001, effect size 0.607
Self-Care Management (n = 29)	50.9 ± 28.1	68.4 ± 23.3	P = 0.002, effect size 0.295
Self-Care Confidence (n = 41)	54.65 ± 22.2	81.23 ± 17.9	P < 0.0001, effect size 0.625

Table 2

Integrated results: Two exemplars of self-care change over time with illustrative quotes.

	Pre-Intervention/first session		Post-Intervention/last session	
	Quantitative SCHFI	**Qualitative Illustrative quotes**	**Quantitative SCHFI**	**Qualitative Illustrative quotes**
Improved: Self-Care maintenance, Symptom recognition, Self-Care management and Self-Care confidence	Self-Care Maintenance: 57	• "I'm drinking tremendous amounts of fluid" • "I wasn't taking water pill every single day… sometimes I miss two days or so …" • "I try to keep to <low salt diet>. What I try to do is maybe once a week eat a hoagie or steak sandwich … maybe only half of it"	Self-Care Maintenance: 80	• "I'm only supposed to take in. 64 ounces. Don't drink any more than—than 64 ounces a day. I'm careful about that." • " I don't play around with that <medication>…I read all about what it is, that I should take it" • "I've been eating a lot more salads"
	Symptom Recognition: 0	• "I just simply didn't feel it <symptoms>"	Symptom Recognition: 4	• "… no episodes of shortness of breath since last time … but I would be able to tell"
	Self-Care Management: 30	• "It came on and I called my brother to take me to emergency room"	Self-Care Management: 80	• "If *I start with <dyspnea> I stop what I'm doing… then call <doctor> if no better* "
	Self-Care Confidence: 67	• "On a scale of 1 to 10…I am a 5 right in the middle…I can do it if I try"	Self-Care Confidence: 100	• " I know I can tell <worsening symptoms> because of the walking and the taking the diuretic regularly… "

Summary: There was concordance between the quantitative and qualitative data. This participant improved in all elements of self-care.

Improved: Self-Care maintenance and Self-Care confidence **No change**: Sx recognition or Self-Care management	Self-Care Maintenance: 60	• "…I eat TV dinners most days…?I don't buy fresh vegetables, I buy in the can but I rinse those … " "we have Chinese food some days" • "every day I drank my four glasses and if I am thirsty. I might take another cup"	Self-Care Maintenance: 70	• "I am taking my medicine" • "… and eating right. not eating those fried foods and all that kind of fat … • '<Weighs self> regularly, once a week'

	Pre-Intervention/first session		Post-Intervention/last session	
	Quantitative SCHFI	**Qualitative Illustrative quotes**	**Quantitative SCHFI**	**Qualitative Illustrative quotes**
		• "\<weighs\> to see if I got water on me; fluid you know… but not every day … maybe when I think about it"		
	Symptom Recognition: 4	• "… a real tight space. It is like I am in a box …"	Symptom Recognition: 4	*"\<last week\> my legs were swollen and I felt tired"*
	Self-Care Management: 55	• "…if I gain like two or three pounds in a day; \<doctor\> wants me to come back"	Self-Care Management: 55	*"…I decided myself that I was going to the emergency room…"*
	Self-Care Confidence: 67	• "I think I handle my diet pretty good …"	Self-Care Confidence: 78	• "… just put your mind to it, and do it. • I think I'm doing good … yes, I'm doing alright at this"

Summary: There was concordance between the quantitative and qualitative data. This participant improved in self-care maintenance and confidence primarily through improved diet and medication adherence. Although she did not weigh herself daily she did start to weigh herself regularly on a weekly basis. She was able to recognize her symptoms but remained unchanged in symptom management.

SCHFI=Self-care of Heart Failure Index. Note that scores are standardized 0–100. Symptom recognition scores are single items that range from 0 to 4.