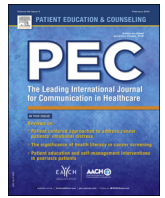




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## Patient Education and Counseling

journal homepage: [www.elsevier.com/locate/pateducou](http://www.elsevier.com/locate/pateducou)



### Research Paper

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

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#### ARTICLE INFO

##### Article history:

Received 17 June 2016

Received in revised form 16 August 2016

Accepted 29 August 2016

##### Keywords:

Behavioral change

Motivational interviewing

Patient compliance

Counseling

Self-management

#### 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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## 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

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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 100. 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 non-adherence) 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].

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