Original Article

Motivational interviewing to improve the self-care behaviors for patients with chronic heart failure: A randomized controlled trial

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ABSTRACT

Objectives: This study aimed to investigate the effect of motivational interviewing on the self-care behaviours in patients with chronic heart failure.
Methods: Sixty-two hospitalized patients with chronic heart failure were recruited in this study from April 2014 to April 2015 from a hospital. Twenty-nine patients were in the intervention group, and 33 patients were in the control group. Patients in the intervention group received four sessions of motivational interviewing, whereas those in the control group received traditional health education. At 2, 4, and 8 weeks post-discharge, the intervention group underwent telephone follow-up based on motivational interviewing, whereas the control group underwent routine telephone follow-up. Primary outcome was measured using the Self-care of Heart Failure Index at baseline and at 2 months post-discharge.
Results: Before intervention, the self-care behaviours scores were 79.00 ± 48.80 in the intervention group and 88.68 ± 29.26 in the control group. No statistically significant differences were found between two groups in scores for each subscale and total scale ($P > 0.05$). After intervention, the scores of self-care behaviours in the two groups were both improved at 155.13 ± 35.65 for the intervention group and 115.44 ± 22.82 for the control group with statistically significance ($P < 0.01$). The score of self-care behaviours increased by 76.13 point in the intervention group on average, whereas 26.76 point in the control group. There was significant difference between increases in scores of self-care behaviours in two groups ($P < 0.01$).
Conclusions: The self-care behaviours of patients with chronic heart failure could be improved effectively through motivational interviewing.

1. Introduction

Chronic heart failure (CHF) has emerged as a major public health problem that affects 1%–2% of the world's population. This disease is associated with poor quality of life and frequent and costly hospitalization. CHF affects the patients' self-care ability and thus brings forth a heavy burden for the family and society [1]. Patients with CHF are required to follow the standard drug treatment and pay close attention to their diet, physical activity, body condition monitoring, behaviour and emotion management, correct recognition of symptoms, treatment effect evaluation, and other types of

self-care behaviour. According to a previous study, patients with CHF exhibited low self-care behaviours regardless if they live in developed or developing countries [2]. Therefore, the self-care behaviours of patients with CHF must be improved by providing guidance and effective management.

Motivational interviewing (MI) can improve unhealthy patient behaviours and increase the self-management ability, the level of mental health, and the compliance to treatment among patients with chronic diseases. This method is widely used in the medical field for pain management, diabetes, weight control, and HIV prevention. Thus, achieving behavioural changes has become one of

the main modalities [3,4]. In this study, we aimed to evaluate the effect of MI on self-care behaviours in a selected sample of patients with CHF.

2. Methods

2.1. Setting and sample

All the recruited participants were hospitalized at the cardiology department in a teaching hospital of medical university from April 2014 to April 2015. Inclusion criteria were as follows: aged between 18 and 70 years; diagnosed with CHF according to the CHF diagnostic criteria of Cardiovascular Branch of the Chinese Medical Association [5]; with abilities to speak, read and communicate; willing to participate in the study and signed an informed consent form; not take part in any other research study at the same time. Exclusion criteria were as follows: do not have the ability of self-care; with cognitive impairment or mental disease; with other serious diseases, such as malignant tumor, end-stage renal, and liver disease or undergoing radiotherapy. This study was approved by the hospital ethics committee. The purpose and significance of this research were explained to participants, and written informed consent was obtained before the start of the study.

A single blind randomized controlled trial design was adopted. From April 2014 to April 2015, 158 CHF patients were admitted to the hospital. According to the selection criteria, 86 patients were excluded, including 43 patients older than 70 years, 14 with serious diseases to participate in the research, 13 with complication of renal failure or malignant tumor, 4 with difficulty to communicate, and 12refusing to participate in the study. Finally, 72 patients were recruited.

A three-digit random number was generated from the computer every time as a patient was recruited in this study. If the number is odd, the patient would be assigned to the intervention group; otherwise, to the control group. Therefore, 35 patients were categorized into the intervention group, and 37 patients were assigned to the control group. During the period, one patient withdrew from the study because of disease exacerbation, and five did not complete the telephone follow-up after discharge in the intervention group. In the control group, one patient did not complete the telephone follow-up after discharge, and three missed follow-up because of disease exacerbation. Finally, 62 patients completed the intervention and follow-up. Among them, 29 patients were in the intervention group, and 33 patients were in the control group. The patients in different groups had been assigned to different wards to control information bias.

2.2. Data collection

The Chinese version of the Self-Care of Heart Failure Index (SCHFI) was used to measure self-care behaviours at baseline and at 2 months after discharge. This questionnaire was developed based on strict principle of translation, back-translation, and cross-cultural adaptation. The reliability and validity of SCHFI were tested among 200 patients with heart failure. The coefficient of Cronbach's α was 0.853, and the test-retest reliability was 0.861. This Chinese version of SCHFI is reliable and valid and can be used for the measurement of self-care behaviours among Chinese patients with heart failure [6]. The scale contains the following three sections and involves 22 items: 1) self-care maintenance (10 items), including the treatment adherence behaviours and self-monitoring, which is scored by a four-point Likert scale from 1 to 4; 2) self-care management (6items), including one symptom recognition item that is scored by a five-point Likert scale from 0 to 4, four symptoms treatment items that were scored by four-point

Likert scale from 1 to 4, and one effectiveness evaluation item that is scored by five-point Likert scale from 0 to 4; and 3) self-care confidence (6 items), including self-care maintenance confidence (2 items) and self-care management confidence (4 items) that were scored using a four-point Likert scale from 1 to 4. The scale was approved by scale's author.

The demographic and clinical information, including age, sex, and education degree, number of previous hospitalizations and New York Heart Association (NYHA) Functional Classification of all participants were collected on the first day or next day after admission. SCHFI questionnaire was explained to the patients by investigators in a standardized way and completed according to the patient's answer. The patients were encouraged to truthfully answer the questionnaire to ensure information reliability.

2.3. Procedures

2.3.1. Intervention group

In the hospital, the average hospital stay of patients with CHF ranged from 2 weeks to 3 weeks. Every patient in the intervention group received four sessions of MI with each session lasting 15–20 min. MI sessions were delivered by two investigators who were highly experienced in MI and cardiovascular nursing. The specific contents of the interventions were as follows:

Session 1: Session 1 focused on building a trusting relationship with the patient; and learning about the problems by inquiring about the patient's main symptoms, subjective feelings, lifestyle, disease control experience, psychology, and difficulties throughout the course of illness. The investigators evaluated the patient's self-care behaviours a month before readmission and select the wrong behaviours and concepts to guide the patients in realizing the problems in their self-care behaviours.

Sessions 2 and 3: These sessions focused on seeking out solutions for self-care problems. The investigators encouraged the patients to talk about the difficulties when changing behaviours and guided the patients to think about ways of solving these problems. The usual questions were as follows: 1) which behaviour do you think need to be changed? 2) What do you worry about when you change these behaviours? 3) How do you think about your choices? 4) What is the ideal situation for you? 5) What good results do you think you can obtain, if you make the change? 6) What do you think you ought to do next? Let patients list out the solutions themselves. Investigators evaluated and corrected the solutions when necessary. During MI, the investigators used positive and encouraging words instead of criticizing or blaming patients to avoid patient antagonism.

Session 4: Investigators and patients confirmed the planned behavioural changes together. The investigators then assisted the patients in creating the specific details and steps of the plan. Patients, rather than researchers, determined an achievable goal. The investigators did not emphasize specific levels that the patients need to achieve. Second, the researchers listed out the specific details in written form for patient's reference. Finally, the researchers informed the patients of the telephone follow-up plans after discharge to assure them that a professional educator is always present to help him/her solve any problems and provide support to enhance his/her confidence.

Following the MI principles, the intervention group received a telephone follow-up call at 2, 4, and 8 weeks post-discharge. During the weeks of follow-up, if the patients did not answer the call for 3 consecutive days, then they were considered to have withdrawn the follow-up. The call was planned to last for approximately 10 min–15 min. The main contents were as follows: discussing the effects of changing behaviours on the health status, life, work, and others; encouraging the patients to talk about the obstacles and

difficulties during changing behaviours; providing professional suggestions to patients; encouraging patients to continue to implement the plan and reinforcing their commitment to change behaviours to complete self-care plans. After the last call of follow-up, investigators filled out the SCHFI questionnaire according to the patient's answers to evaluate their self-care behaviours after the intervention.

2.3.2. Control group

The patients in the control group received conventional health education three or four times by an experienced nurse in cardiovascular nursing during hospitalization. The contents of health education include basic knowledge of CHF, risk factor control, adequate exercise, limiting diet and liquids, symptom monitoring, regular checks, medication adherence, side effects, and usage of common drugs. After discharge, the patients received routine telephone follow-up. The intervals of the follow-up were same as those of the intervention group. The main focus was answering the questions of patients, strengthening the health education knowledge, and encouraging patients to improve their self-care behaviours. The self-care behaviour types were evaluated by investigators after the last telephone follow-up in the same manner as in the intervention group.

2.4. Analysis

The three sections of the SCHFI were scored. Each scale was standardized to a score of 100 for comparison, and the total score was calculated. The formulas used were as follows [7]: Self-care maintenance = (raw score − 10) × 3.333; Self-care management = (raw score − 4) × 5; Self-care confidence = (raw score − 6) × 5.56. The total score of the scale is 300 points. A high score indicates excellent self-care behaviours of the patient.

Data were analyzed using SPSS 13.0 for Windows. Means and standard deviation were used to describe the patient's baseline characteristics. χ^2 test was used to compare general data between the two groups. Measurement data were expressed as $Mean \pm SD$, and comparisons between two groups were performed using t-test. Statistical significance were indicated by $P < 0.05$.

3. Results

The characteristics of the total sample ($n = 62$) were similar. Patients had an average age of 59.94 ± 6.93 years. The demographic characteristics and NYHA Functional Classifications of patients are shown in Table 1.

Table 2 shows the scores of SCHFI at baseline and at 2 months after discharge. The self-care behaviour scores of both groups were low before the intervention, and no statistically significant differences were found for each subscale score and total score ($P > 0.05$). After intervention, all of the scores of self-care behaviour items in the SCHFI were improved in both groups, and the difference was statistically significant compared with the baseline scores ($P < 0.01$). The improvement of self-care behaviours in the intervention group was more significant than that in the control group ($P < 0.01$).

4. Discussion

4.1. Motivational interviewing

MI was first developed by Miller and Rollnick in the early 1990s as an alternative to the conventional medical model of promoting behavioural changes among problem drinkers. This method is a collaborative goal-oriented style of communication to strengthen a person's own motivation and commitment to change based on the most direct observations of clinical practice and many social psychology theories. Its purpose is to enhance the intrinsic motivation and behaviour changes by properly handling various mental contradictions of patients regarding behavioural change [8]. The core of MI is that through conversations with patients, they are led to weigh the advantages and disadvantages to enhance their willingness and confidence for behavioural change. During MI, argument, persuasion and confrontation with patients are avoided as far as possible. Patients are encouraged to consider the reasons for their problem behaviours, explore new possibilities, and find solutions to their problems. For the patients, MI always emphasizes on establishing the intrinsic motivation of behavioural change and then promotes the change of people action. Compared with traditional health education, MI is a method in which communication with patients must be one-on-one and face-to-face. Therefore, the solutions for behavioural changes are individually developed and based on the patient's characteristics and problems. During communication, MI shows better understanding to the patient's behaviour than conventional methods. Therefore, MI is not only a method for interview but is also a clinical strategy and skill that encourages patients to change their negative behaviour.

Table 1
Characteristics of patients [n(%)].

Variable	Intervention group ($n = 29$)	Control group ($n = 33$)	χ^2	P
Age (year)				
≤50	3 (10.3)	4 (12.1)	0.41	0.817
51−60	11 (37.9)	10 (30.3)		
61−70	15 (51.7)	19 (57.6)		
Gender				
Female	8 (27.6)	9 (27.3)	0.00	0.978
Male	21 (72.4)	24 (72.7)		
Hospitalization times				
2−3	15 (51.7)	17 (51.5)	0.01	0.995
4−5	9 (31.0)	10 (30.3)		
>5	5 (17.2)	6 (18.2)		
Educational level				
Elementary school	12 (41.4)	13 (39.4)	0.17	0.917
Secondary school	10 (34.5)	13 (39.4)		
College degree or above	7 (24.1)	7 (21.2)		
NYHA classification				
II	2 (6.9)	3 (9.0)	0.28	0.871
III	12 (41.4)	15 (45.5)		
IV	15 (51.7)	15 (45.5)		

Table 2
Self-care behaviours before and after the intervention in different groups (*Mean ± SD*).

Items	Intervention group				Control group				Before*		After*	
	Before	After	t	P	Before	After	t	P	t	P	t	P
Self-care maintenance	25.40 ± 13.95	44.82 ± 14.21	−12.107	0.000	30.10 ± 7.29	33.63 ± 5.55	−6.775	0.000	−1.178	0.091	3.981	0.000
Self-care management	33.28 ± 22.13	62.76 ± 16.78	−11.362	0.000	38.03 ± 16.91	48.79 ± 16.59	−6.324	0.000	−0.957	0.342	3.292	0.002
Confidence	20.32 ± 21.70	47.55 ± 17.99	−9.705	0.000	20.55 ± 11.2	33.02 ± 8.56	−8.044	0.000	−0.052	0.959	3.97	0.000
Total scores	79.00 ± 48.80	155.13 ± 35.65	−18.082	0.000	88.68 ± 29.26	115.44 ± 22.82	−10.269	0.000	−0.932	0.357	5.14	0.000

Note: *Comparison of the two groups.

4.2. CHF and self-care behaviours

Despite the introduction of effective modalities of treatment, the symptoms of patients with CHF rarely achieve ideal control, leading to frequent and costly hospitalizations. Readmission rates of patients with CHF were as high as 27%—47% during the 3—6 months after discharge [9]. This study showed that the self-care behaviour scores of CHF patients are generally low, reflecting that their self-care ability needs to be improved. The main issues of patients with CHF are focused on the low awareness rate for the disease, lack of self-care knowledge, and cognitive errors in the recognition and treatment of symptoms. Moreover, compliance of self-care behaviour is poor, especially in the control of water and salt intake. These results are consistent with past related research [10—13]. With social development and ageing population, the number of patients with CHF will continuously increase in the future. In this setting, the importance of self-care behaviours become relevant. In addition, finding methods to help patients improve self-care behaviour and compliance to treatment and rehabilitation is of great concern.

4.3. Effects of MI

Health education is the most common and important intervention to improve the behaviour of patients with CHF. Standard health education for patients with CHF enables them to master the necessary self-care skills and improve their self-care behaviour that allows them to attain a satisfactory control [14,15]. In this study, we found that both MI and routine health education can improve the self-care level of patients with CHF, and MI has a more significant effect. Related studies show that MI is beneficial for the improvement of behaviours regarding water and salt intake and exercise in patients with CHF [16,17]. MI can also enhance the quality of life and medication adherence among these patients [18—20].

In this research, we found that patients are willing to carry out the plans they made by themselves because these plans are more in line with their own habits and lifestyle. Many patients said, 'It's easier to implement a plan with clear rules and goals. We not only know "what to do", but also know "how to do it".' For instance, in the plans of salt restriction, most of the patients were willing to reduce sodium intake but were confused with the specific implementation details. First of all, we provided a table that includes the sodium content of common foods to ensure patients to be familiarized with these data. Then, we discussed with patients whether or not he/she could refuse to eat some foods or reduce the portions of foods, such as decreasing the frequency of eating pickled foods and canned foods. Compared with completely giving up certain dietary habits, the patients were allowed to accept the changes gradually. Second, we offered a standard salt spoon to patients according to the patient's family scale to help them calculate the amount of daily salt intake. Patients only need to remember how many tablespoons of salt are needed. These kinds of plans were acceptable by majority of patients. Most of them said such plans are

practical and that their families also benefit from such changes. Although traditional health education is patient-centered, it can make patients feel distant to their goals. In addition, the goals tend to be rigid and cannot be adapted in accordance with the patient's lifestyle. When some measures generate conflict with patient's daily life or work, they are generally given up by patients, leading to poor compliance to the intervention. During the study, a patient could not complete the exercise plan because of scheduling interference with work. After knowing his actual conditions, we proposed that he get off the bus a stop earlier and then walk home. He was willing to accept this plan. During the follow-up interview, his compliance was extremely high.

The content of routine telephone follow-up is standard and general which does not emphasize a certain point according to personable problems. By contrast, the telephone follow-up of MI is individualized. This method includes the contents of health education, supervises and guides the patient according to the plans of behavioural change that were developed previously, gives affirmations of the goals achieved, attempts to solve difficulties faced by patients, and strengthens their commitments regarding behavioural changes. Basing on the telephone communication with patients, we found that most patients were willing to share their success and joy with others after achieving behavioural changes. This phenomenon was an encouragement for them and promoted the active performance of self-care plans.

Self-efficacy is an essential factor in maintaining and managing the self-care behaviours of patients with chronic diseases. A high level of self-efficacy indicates high degree of effort to achieve behavioural change and behaviour maintenance, thus improving the self-care behaviour and changing the health outcome [21]. Even if the patients are motivated, they still cannot successfully change their behaviour if they lack confidence. MI enhances the confidence of patients by emphasizing on their achieved goals in behavioural changes, which have a significant role in improving self-efficacy [22]. Self-efficacy also means that any decision about behavioural changes is independently made by the patients themselves. In implementing MI, the patients, not the researchers or other persons, apperceive, judge, select the scheme of changing behaviour problems, and put the plans in action.

5. Limitations of the study

During MI implementation, we also encountered some problems. The first is the qualification of the interviewers. The interviewer would face different types of patients in a clinical environment. They need to adapt in accordance with their aptitude. Therefore, the interviewers should not only master the professional knowledge of diseases but also have good interpersonal and communication skills. The interviewers need to review detailed material to understand the basic situation of the patients and change the targeted intervention programs according to the specific conditions of patients. The purpose is to avoid confusion with traditional spoon-feeding education and not to further weaken the

patient's motivation for behavioural changes. Thus, a high demand was placed on the interviewer, which also involves additional manpower and time consumption. At present, the domestic interviewers are mostly nurses who generally only accept guidance for MI before the interviews. In developed countries, the interviewers include clinical medical staff, community health care personnel, and psychologists who receive training regarding treatment guidelines, teaching methods, and structure of reading [23].Therefore, the training of interviewer should be continuously improved and expanded. The second limitation is that our study only evaluated patients until 2 months after discharge. Data regarding the long-term effects of MI are still lacking. Although this study proved that MI can achieve a significant effect in the short term, its long-term effect is uncertain. The effects of MI are weakened gradually in the following 6 months—12 months [24]. Continuing and maintaining the effect of MI remains to be researched.

6. Conclusions

This pilot study aimed to evaluate the effect of MI intervention on the self-care behaviours of patients with CHF. Our results showed that MI effectively improved the self-care behaviour in patients with CHF. Compared with traditional health education, MI had a more significant effect. Improving the self-care behaviour in patients with CHF is a crucial way to solve their issues with food, water and salt intake, body weight monitoring, medication compliance, and judgment of early symptoms to obtain satisfactory treatment effects [25,26]. Promoting the application of MI in the management of patients with CHF consequently has important significance. However, fostering additional medical personnel with MI skills and promoting the lasting effect of MI remains to be further researched and explored.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.ijnss.2018.04.012.

References

[1] Rabelo ER, Aliti GB, Goldraich L, Domingues FB, Clausell N, Rohde LE. Non-pharmacological management of patients hospitalized with heart failure at a teaching hospital. Arq Bras Cardiol 2006;87(3):352—8.
[2] Riegel B, Driscoll A, Suwanno J, Moser DK, Lennie TA, Chung ML, et al. Heart failure self-care in developed and developing countries. J Card Fail 2009;15(6): 508—16.
[3] Walpole B, Dettmer E, Morrongiello B, Mccrindle B, Hamilton J. Motivational Interviewing as an intervention to increase adolescent self-efficacy and promote weight loss: methodology and design. BMC Publ Health 2011;11(1). 459—459.
[4] Dellasega C, Añel-Tiangco RM, Gabbay RA. How patients with type 2 diabetes mellitus respond to motivational interviewing. Diabetes Res Clin Pract 2012;95(1):37—41.
[5] Chinese Society of Cardiology. Guidelines for the Evaluation and Management of chronic heart failure. Chin J Cardiol 2007;35(12):17—36 [Chinese].
[6] Chen W, Lin P, Li L. Reliability and validity of the Chinese version of self-care of heart failure index. Chin J Nurs 2013;48(7):629—31 [Chinese].
[7] Riegel B, Lee CS, Dickson VV, Carlson B. An update on the self-care of heart failure index. J Cardiovasc Nurs 2009;24(6):485—97.
[8] Miller WR, Rollnick S. Motivational interviewing: helping people change. third ed. New York: The Guilford Press; 2012. p. 482.
[9] Ågren S, Evangelista LS, Hjelm C, Strömberg A. Dyads affected by chronic heart failure: a randomized study evaluating effects of education and psychosocial support to patients with heart failure and their partners. J Card Fail 2012;18(5):359—66.
[10] Luyster FS, Hughes JW, Gunstad J. Depression and anxiety symptoms are associated with reduced dietary adherence in heart failure patients treated with an implantable cardioverter defibrillator. J Cardiovasc Nurs 2009;24(1): 10—7.
[11] Ming LC, Hassali MA, Shafie AA, Awaisu A, Hadi MA, Al-Haddad M. Perspectives of heart failure patients in Malaysia towards medications and disease state management: findings from a qualitative study. J Public Health 2011;19(6):569—77.
[12] Dickson VV, Mccarthy MM, Howe A, Schipper J, Katz SM. Sociocultural influences on heart failure self-care among an ethnic minority black population. J Cardiovasc Nurs 2013;28(2):111—8.
[13] Tsai PK, Wang RH, Lee CS, Tsai LM, Chen HM. Determinants of self-care decision-making in hospitalised patients with heart failure. J Clin Nurs 2014;24(7—8):1101—11.
[14] Franek J. Self-management support interventions for persons with chronic disease: an evidence-based analysis. Ont Health Technol Assess Ser 2013;13(9):1—60.
[15] Clark AP, Mcdougall G, Riegel B, Joinerrogers G, Innerarity S, Meraviglia M, et al. Health status and self-care outcomes after an education-support intervention for people with chronic heart failure. J Cardiovasc Nurs 2015;30(4 Suppl 1):S3—13.
[16] Brodie DA, Inoue A. Motivational interviewing to promote physical activity for people with chroni cheart failure. J Adv Nurs 2005;50(5):518—27.
[17] Lennie TA, Chung ML, Moser DK. What should we tell patients with heart failure about sodium restriction and how should we counsel them? Curr Heart Fail Rep 2013;10(3):219—26.
[18] Possidente CJ, Bucci KK, Mcclain WJ. Motivational interviewing: a tool to improve medication adherence? Am J Health Syst Pharm 2005;62(12): 1311—4.
[19] Brodie DA, Inoue A, Shaw DG. Motivational interviewing to change quality of life for people with chronic heart failure: a randomised controlled trial. Int J Nurs Stud 2008;45(4):489—500.
[20] Stawnychy M, Creber RM, Riegel B. Using brief motivational interviewing to address the complex needs of a challenging patient with heart failure. J Cardiovasc Nurs 2014;29(5):1—6.
[21] Wu SF, Huang YC, Lee MC, Wang TJ, Tung HH, Wu MP. Self-efficacy, self-care behavior, anxiety, and depression in Taiwanese with type 2 diabetes: a cross-sectional survey. Nurs Health Sci 2013;15(2):213—9.
[22] Gao X, Lo CM, Mcgrath C, Ho MY. Face-to-face individual counseling and online group motivational interviewing in improving oral health: study protocol for a randomized controlled trial. Trials 2015;16(1):1—7.
[23] Ingersoll KS, Ceperich SD, Hettema JE, Farrell-Carnahan L, Penberthy JK. Preconceptional motivational interviewing interventions to reduce alcohol-exposed pregnancy risk. J Subst Abuse Treat 2013;44(4):407—16.
[24] Rohsenow DJ, Martin RA, Monti PM, Colby SM, Day AM, Abrams DB, et al. Motivational interviewing versus brief advice for cigarette smokers in residential alcohol treatment. J Subst Abuse Treat 2014;46(3):346—55.
[25] Lee CS, Moser DK, Lennie TA, Riegel B. Event-free survival in adults with heart failure who engage in self-care management. Heart Lung 2011;40(1):12—20.
[26] Dickson VV, Melkus GD, Dorsen C, Katz S, Riegel B. Improving heart failure self-care through a community-based skill-building intervention: a study protocol. J Cardiovasc Nurs 2015;30(4 Suppl 1):S14—24.