Development of a tele-health cardiac rehabilitation program: Working with the client for optimal health

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Development of a tele-health cardiac rehabilitation program: Working with the client for optimal health

Abstract
Cardiac rehabilitation decreases mortality, decreases recurrent myocardial infarctions and increases physical and psychosocial functioning after a myocardial infarction (MI). Treatment post-MI is most effective for patients when it is tailored to meet their own needs. Patients are also more likely to participate in treatment that is tailored to fit their specific needs. It has been found that tele-health increases patient’s utilization of rehabilitation and treatment after they have been diagnosed with a chronic illness, such as heart disease. Despite these findings, people are not utilizing cardiac rehabilitation post MI, especially women and older adults.

This study utilized an online treatment options booklet for patients’ post-myocardial infarction, to find which treatments the patient believed they would participate in, and provided them information to participate in said treatments. A tele-health intervention tailored to the MI patients’ own needs to increase their utilization of cardiac rehabilitation post-MI.

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DEVELOPMENT OF A TELE-HEALTH CARDIAC REHABILITATION PROGRAM:
WORKING WITH THE CLIENT FOR OPTIMAL HEALTH

A DISSERTATION DEFENSE

SUBMITTED TO THE FACULTY
OF
SCHOOL OF PROFESSIONAL PSYCHOLOGY
PACIFIC UNIVERSITY, HILLSBORO, OREGON

BY
KRISTIN TIERNAN

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DOCTOR OF PSYCHOLOGY

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Cardiac rehabilitation decreases mortality, decreases recurrent myocardial infarctions and increases physical and psychosocial functioning after a myocardial infarction (MI). Treatment post-MI is most effective for patients when it is tailored to meet their own needs. Patients are also more likely to participate in treatment that is tailored to fit their specific needs. It has been found that tele-health increases patient’s utilization of rehabilitation and treatment after they have been diagnosed with a chronic illness, such as heart disease. Despite these findings, people are not utilizing cardiac rehabilitation post MI, especially women and older adults.

This study utilized an online treatment options booklet for patients’ post-myocardial infarction, to find which treatments the patient believed they would participate in, and provided them information to participate in said treatments. A tele-health intervention tailored to the MI patients’ own needs to increase their utilization of cardiac rehabilitation post-MI.
CHAPTER 1: LITERATURE REVIEW

1.1 Cardiac Rehabilitation

Cardiac rehabilitation is a multidisciplinary program designed to optimize physical, psychological, and social functioning of patients with cardiovascular disease (Parkosewich, 2008). Cardiac rehabilitation (CR) has been found to reduce depression, anxiety, and mortality, and increase psychosocial well-being, health behaviors, and overall quality of life (Allen, Scott, Stewart, & Young 2004).

Along with these benefits, CR has been found to reduce mortality and morbidity (Allen, Scott, Stewart, & Young 2004). CR also decreases re-hospitalization for cardiac related events and medical costs (Allen, Scott, Stewart, & Young, 2004). In a study done by Grace, Grewal, Arthur, Abramson, and Stewart (2008), CR participation was assessed nine months post discharge, and it was found that 45% had participated in a CR program. When comparing those that did participate to those that did not, those that had showed significant improvement in physical quality of life, anxiety, and exercise behavior. Kristjánsson, Porunn, and Jonasson (2007) found that a comprehensive CR program reduced depression rates from 9.5% to 3.1% and reduced anxiety from 11.6% to 2.5% among patients enrolled in a CR program in Iceland.

Research has found that CR programs must be tailored to fit the needs of the individual (Jones, et al, 2009). It is recommended that a plan be developed between patient and clinician to assess those needs and develop a treatment plan that fits patient’s specific needs (Jones, et al, 2009). Along those lines, the American Heart Association (AHA) has introduced the Heart Profiler to their website as a way to build individualized
treatment for individuals with heart problems, such as an MI, Coronary Artery Bypass Graft surgery, and heart failure (Jones et al, 2009). In a study, conducted in collaboration with AHA, patients enrolled in Heart Profiler were compared to those that were not. It was found that patients who used Heart Profilers were more aware of their treatment options, more likely to ask doctors questions about their care, had a greater understanding of their medications, and were more likely to use their medication as prescribed by their doctor. Some of the treatment options that have been found to be most helpful for patients, post-MI, include social support, exercise training, diet modification, smoking cessation programs, support groups, individual therapy, stress management, complementary and alternative medicine, education, medication and surgery (Jones et al, 2009).

1.1.1 Social Support Group

Support groups are an important part of long term rehabilitation after a cardiac event (Hildingh, 2001). Members of support groups have the opportunity to receive and provide support (Hildingh, 1995). Bagheri, Memarian and Alhani (2007) conducted a study to examine the effect of group counseling on quality of life (QOL) in patients, post-MI, compared to a control group. They were assessed on QOL before group counseling began, and one month after group counseling ended. There was no significant difference in QOL between groups before the intervention began; after treatment, there was a significant difference in QOL between groups. Bagheri, Memarian, and Alhani (2007) concluded that group counseling can promote QOL in all dimensions.
1.1.2 Exercise Training

Exercise training is a core element of contemporary CR programs (van Dixhoorn, 1989). Regular physical activity, such as aerobic exercise, has been shown to increase functional capacity, lower blood pressure, and lower cholesterol. It has been found to significantly reduce mortality after an MI. Exercise capacity aids long-term rehabilitation post-MI (van Dixhoorn, 1989). In a study conducted by van Dixhoorn (1989) of an exercise training program after an MI, he found, in a 2-year follow-up to the exercise training program, the participants had significantly lowered heart rates, systolic blood pressure, and fewer signs of cardiac dysfunction. In a 5-year follow-up, participants from the exercise training program still maintained fewer heart rate problems (van Dixhoorn, 1989).

Exercise training can also have positive effects on patient’s psychosocial well-being post-MI (Taylor, Houston-Miller, Ahn, Haskill, & DeBusk, 1986). In a study to determine the effects of exercise training on psychosocial improvement, Taylor et al. (1986) found that participants in both of the exercise training groups improved, 3-26 weeks post MI, on all depression and anxiety measures. Finlayson (1997) found that exercise training resulted in a 20% reduction in overall mortality, a reduction in depression and anxiety, a reduced exercise heart rate, lowered blood pressure, reduced angina, and an increase in myocardial contractility. Williams (2001) found that exercise training, like most of other treatments post-MI, must be tailored to individual needs, such as: functional status, medical history, co-morbid disorders, preference, and outcomes.
1.1.3 Diet modification

Adopting a healthy lifestyle with balanced nutrition can lower cholesterol, reduce recurrent MI, and need for surgery or angioplasty. One of the ways to do this is to reduce the amount of saturated fats, salts, and meats consumed (Jackson, 2004). Studies have established the benefits of diet modification programs, emphasizing a reduction in cholesterol in secondary prevention of coronary artery disease (Krauss, 2000). Diet modification programs are an integral part of any rehabilitation program (Schulz et al., 2008). They have been found to increase physical functioning, cardiac functioning, and psychosocial well-being (Michalsen, 2006; Blumenthal, 2005).

1.1.4 Smoking Cessation

Smoking cessation programs aid in the reduction of current smoking use and quitting smoking completely (Goldstein & Niaura, 2006). Individuals who quit smoking after an MI can have up to a 50% risk reduction in subsequent MI (Jones et al, 2009). Smoking cessation programs have been found to be most effective when they include nicotine replacement therapy and bupropion with behavioral counseling (Goldstein & Niaura, 2000). Such programs have been found to reduce mortality by 35-45% (Quist-Paulsen, 2006). Research has also indicated a positive relationship between smoking cessation and CVD risk (Goldstein & Niaura, 2000).

1.1.5 Individual Counseling

with behavioral therapies (psychoeducation) to risk reduction with medical therapy (beta-blockers, antiplatelets, calcium blockers, IV heparin, and CABG) in patients post-MI. He found that risk reduction of non-fatal MI and cardiac deaths observed through behavioral therapy were superior to any form of medical therapy (Ketterer, 1993). Also, Oldridge (1988) found a 24% reduction in all-cause mortality and a 25% reduction in CVD death when participants participated in a cardiac rehabilitation program that included psychological treatment.

1.1.6 Stress Management

Stress management can include autogenic training, biofeedback, cognitive-behavioral therapy, meditation, and relaxation techniques such as deep breathing and imagery (Jackson, 2004). Deep diaphragmatic breathing has been shown to be helpful in CR and treating other heart problems (Gilbert, 2003). Stress management has been found to help with psychosocial recovery post-MI (Ketterer, 1993). In a study done by vanDixhooran, Duivenvoorden, Staal, and Pool (1989), patients receiving exercise training and patients receiving exercise training combined with relaxation techniques post-MI were compared. They found relaxation techniques enhanced training benefits, and reduced the risk of failure in exercise training by half (vanDixhooran, Duivennoorden, Staal, & Pool, 1989). In a five-year follow up study, it was revealed that the total number of hospital visits was reduced by 31% as a result of relaxation instruction (vanDixhooran, 1999).
1.1.7 Complementary and Alternative Medicine

Complementary and alternative medicines are a set of treatments that serve as an adjunct, or to compliment standard treatment options (Baum, Revenson, & Singer, 2001). Some alternative medicine treatments include herbal medicine, homeopathy, yoga and Chinese medicine (Baum, Revenson & Singer, 2001). Alternative medicines have been found to reduce mortality and improve overall quality of life (Baum, Revenson, & Singer, 2001). Patients who pursued complementary and alternative medicine approaches have been found to have greater psychological recovery one year after their cardiac event (Ai & Bolling, 2002).

1.2 Utilization of Cardiac Rehabilitation

Women often feel that their primary need, post-MI, is support, particularly from those with similar experiences (Arthur, Wright, & Smith, 2001). Support groups and stress-management groups have been found to be most effective for women, rather than conventional cardiac rehabilitation programs (Arthur, Wright, & Smith, 2001). Research has shown that men are more likely than women to utilize exercise training after an MI.

Stress management has been found to be helpful for individuals who are currently smoking, by helping them reduce their smoking intake and, eventual, smoking cessation (Kang, Sung, & Kim, 2010). Socioeconomic status has been found to be a predictor for higher inflammation and immune biomarkers for cardiovascular diseases; this would increase their likelihood of an MI and recurrent-MI (Aiello & Kaplan, 2009). Stress management would be a useful facet of cardiac rehabilitation for low income individuals. Further, unemployment can have negative effects on both physical and mental health.
Unemployment has been found to increase people’s levels of reported stress (Fagin, 2006). As a result, these individuals would benefit from a stress management program.

Research has shown that psychotropic medication in combination with psychotherapy is efficacious. Therefore, if a person endorses using psychotropic drugs it is recommended that they participate in individual or group therapy sessions. This has been shown to increase their quality of life and a reduction of MI event recurrence (Linden et al., 2007).

Case, Moss, Case, McDermott, and Eberly (1992) conducted a study to determine if the presence of disrupted marriage or living alone would be an individual prognostic risk factor for a subsequent major cardiac event following an MI. They found that living alone was a significant independent risk factor in prognosis following an MI. In the ENRICHD study (2003), the magnitude of risk associated with low levels of social support were found to be equivalent to those of other well-recognized prognostic indicators of recurrent MI.

Different age groups have different preferences for cardiac rehabilitation as well. Filip, McGillen and Mosca (1999) found that participants who were 65 years old and younger preferred stress management, vocational counseling, and smoking cessation programs. They also found that participants 65 years old and older preferred tele-health rehabilitation.
1.3 Tele-Health Interventions

Tele-health is the delivery of health-related services and information by telecommunication technologies such as the telephone, computer, and the Internet. Telecommunication has been used to remove time and distance barriers in the delivery of health care services (Artinian, 2007). One of the benefits of tele-health for cardiovascular patients is that it provides education, counseling, social support, and disease monitoring and management at home (Artinian, 2007). There are also significant benefits from the cost-effectiveness of tele-health and indications that it decreases utilization of more expensive healthcare services (Hooper, Yellowlees, Marwick, Currie, & Bidstrup, 2001).

In the HEARTCARE study (Brennan, Moore, Bjorsdottir, Jones, Visovsky, & Rogers, 2001), tele-health made recovery more accessible and made the transition from hospital to home more desirable for Coronary Artery Bypass Graft (CABG) surgery when the support service was tailored to the individuals needs. The strongest outcomes for tele-health have been found for chronic disease management, such as hypertension and AIDS (Hersh, Helfand, Wallace, Kraemer, Patterson, Shapiro, & Greenlick, 2001).

Tele-health provides a strong rationale for cardiac rehabilitation due to its positive outcomes for chronic disease management and the low attendance rates for hospital based cardiac rehabilitation programs. Tele-health for cardiac populations has been found to provide effective risk factor education and secondary prevention as well (Neubeck, Redfern, Fernandez, Briffa, Bauman, & Freedman, 2009). Zimmerman and Barnason (2007) found that a tele-health intervention significantly improved cholesterol, exercise
capacity and weekly physical activity when compared to participation in standard cardiac rehabilitation. Nordrehaug, Eide and Hanestad (2007) found that a nurse-led telephone follow-up, after an MI, significantly improved patient’s health-related quality of life. Tele-health provides services to patients in which the treatment is tailored to fit their individual needs and is done on their own time, features that are congruent with what patients need for cardiac rehabilitation to be effective.

1.4 Stages of Change in Health Behaviors

The stages of change model offers an integrative and informative framework for understanding multiple health behaviors and individuals readiness to change (Herrick, Stone, & Mettler, 1997). It is also a useful tool when tailoring treatment for an individual to meet their “stage-matched” needs. Interventions that fail to take into account an individual’s stage of change may be unsuccessful (Burke, Richards, Milligan, Beilin, Dunbar, & Gracey, 2000). And interventions at odds with an individual’s stage of change may impact negatively on the behaviors targeted (Burke et al., 2000).

The stages of change model describes one’s readiness to change behavior; which, moves and recycles through five stages: precontemplation, contemplation, preparation, action, and maintenance (Burke et al., 2000). In precontemplation the individual is not doing the target behavior and is not intending to make changes toward this new behavior; in contemplation the individual is considering change; in planning the individual has an immediate plan of action or has made some behavior changes; in action the individual actively engages in the new behavior or has made changes to their behavior within the past 6 months; in maintenance the individual has sustained change over a period of time
(Nigg et al., 1999). Movement through these stages is not linear; most often individuals move through a cyclical pattern until maintenance is reached (Nigg et al., 1999).

Significant associations have been found for individuals being in the same stage of change across multiple health behaviors (Burke et al., 2000; Nigg et al., 1999). Burke et al. (2000) found that individuals who were in the precontemplation stage for changing dietary behavior were significantly related to being in the precontemplation stage for physical activity. Furthermore, in a study conducted by Nigg et al. (1999), it was found that being in the precontemplation stage for losing weight was significantly related to being in the precontemplation stage for sunscreen use and exercise. However, Herrick, Stone and Mettler (1997) found that 81% of the participants in their study were not in the same stage of change across all four health behaviors (sun exposure, smoking, exercise, and dietary fat intake).

Significant associations between readiness for change across multiple health behaviors may be useful in developing multimodal behavioral interventions rather than focusing on each health behavior individually. Although, associations between the stages of change for each health behavior should be assessed to identify whether their multiple health behaviors are stage-matched before a multimodal behavioral intervention is developed.
OBJECTIVE AND HYPOTHESES

2.1 Objective

The purpose of this study was to assess whether a tailored tele-health Cardiac Rehabilitation program would increase participants utilization of Cardiac Rehabilitation treatment options.

2.2 Hypotheses

2.2.1 Primary Hypothesis

Participants in the tailored treatment group would be more likely to participate in the treatment options that are recommended to them than those in the non-tailored treatment group.

2.2.4 Secondary Hypothesis

Participant’s likelihood of participating in the treatment option would be positively correlated with how beneficial they found the treatment option.

2.2.3 Secondary Hypothesis

There would be a significant difference in their health-related quality of life for the tailored treatment group compared to the non-tailored treatment group.
METHOD

3.1 Participants & Setting

Twenty-seven individuals participated in this study. Participants were people who have experienced a myocardial infarction ever in their life. Participants were over 18 years old and spoke English. A community sample was utilized. In that the study was an online investigation, participants were required to have access to a personal computer, a valid e-mail address, and a printer (if they opt to print the study materials). Also, participants had to commit to participation in three individual study sessions covering a period of approximately six weeks (see Study Design and Procedure section below).

3.2 Measures

3.2.1 Demographics Questionnaire

A demographics questionnaire (Appendix A) was used to assess demographic information specific to the participant. This included age, gender, race, education level, income, employment status, marital status, number of children, smoking status, number of myocardial infarctions, any comorbid disorders (i.e., cancer, hypertension, etc.), whether they identified themselves as religious or not, and whether they were currently receiving treatment for a mood disorder.

3.2.2 CDC Health Related Quality of Life Measure-14 (CDC HRQOL-14)

The HRQOL-14 (Appendix B) is a brief 14 item self-report questionnaire designed as a repeated measure to assess health related quality of life, which the CDC defines as “an individual’s or group’s perceived physical and mental health over time,” (CDC, 2000). It has three modules; the healthy days core module, the activity limitations
module, and the healthy days symptom module. The healthy days core module assessed a person’s perceived well-being through self-rated health, number of recent days when physical health was not good, number of recent days when mental health was not good and number of recent activity limitation days because of poor physical or mental health. The activity limitations module assessed a person’s perceived physical, mental and emotional limitations in their daily life through self-reported limitation, the type of limitation, how long they have been limited, and whether or not they need help from another person with personal care or routine needs as a result of their limitation. The healthy days symptom module assessed a person’s perceived number of recent healthy days related to their symptomatology through self-reported number of recent days they were in pain, depressed, anxious, fatigued, and healthy, relative to their physical, mental and emotional limitations. The HRQOL-14 has been used in the National Health and Nutrition Examination Survey, the CDC Cardiovascular Health Program and the American Cancer Society. It has strong construct validity, concurrent validity, and predictive validity, and good internal consistency with the SF-36 (CDC, 2000).

3.2.3 Outcome Questionnaire-45 (OQ-45)

The OQ-45 is a brief 45-item self-report questionnaire designed to assess an individual’s functional level and change over time in treatment. It has three domains; how a person is feeling, getting along with others, and functioning in important life tasks. It uses a 5-point Likert scale ranging from 0 (never) to 4 (almost always).
3.2.4 Receptivity to Online Information Measure

The Receptivity to Online Information Measure (Appendix C) was a measure used to identify participants’ receptivity to online information. The measure was adapted from a measure developed by O’Malley and McCraw (1999) to assess an individual’s perceptions of the advantages and effectiveness of distance and online learning.

3.2.5 Knowledge Retention Questionnaire

The Knowledge Retention Questionnaire (Appendix D) was developed by the investigator to determine the amount of information gained through exposure to the Behavioral and Lifestyle Treatment Options booklet (see below). The knowledge questions were developed from the description for each treatment option in the Behavioral and Lifestyle Treatment Options booklet. The more questions answered correctly relates to more knowledge retained from the Behavioral and Lifestyle Treatment Options booklet.

3.2.6 Behavioral and Lifestyle Treatment Options Booklet

The Behavioral and Lifestyle Treatment Options Booklet (Appendix E) was designed by the investigator to describe the various treatment options that are often included in cardiac rehabilitation programs. Seven specific treatment options were outlined: social support groups, exercise training, diet modification, smoking cessation programs, individual counseling, stress management, and complementary and alternative medicine. Each treatment was defined (i.e., who facilitates it, what it entails); the course of treatment was outlined (i.e., duration); and the benefits of treatment were outlined (i.e., reduces mortality). For each treatment option, a Likert scale rating from one to five was
presented to determine how likely the individual would be to participate in this treatment option; one being very unlikely to five being very likely. Very likely means you would find this treatment useful and would participate in it. Very unlikely means you would not find this treatment useful and would likely not participate in it. The stage of change algorithm was used to assess their current stage of change for each treatment option (see below).

3.2.6 Stages of Change Questions

Questions assessing the individual’s stage of change were found in both the Behavioral and Lifestyle Treatment Options Booklet and the Participation in Behavioral and Lifestyle Treatment Options Booklet to measure the participants’ stage of change for each treatment option before and after recommendation presentation. The questions were based on a questionnaire and algorithm described by Glanz et al. (1994) to address the stages of change and define the five stages of Precontemplation, Contemplation, Preparation, Action and Maintenance for a person’s health behaviors. Glanz et al. (1994) developed the questionnaire and algorithm specifically for diet, physical activity, alcohol intake and smoking. The questionnaire was validated by Burke et al. (2000) assessing men and women’s stage of change for physical activity, fitness, dietary intake and alcohol consumption. For the current study the questions from the questionnaire and algorithm developed by Glanz et al. (1994) were used for all seven behavior and lifestyle options. Based on the questionnaire and algorithm by Glanz et al. (1994), the participants were asked whether they consider their behavior to be healthy or not. If they answered yes they were be asked how long they have maintained this healthy behavior. If they answered longer than 6 months they were in the maintenance stage. If they answered
within the past 6 months they were in the action phase. If they answered no to whether they considered their behavior healthy they were asked if they intend to change their behavior. If they answered within the next thirty days they were in the preparation phase. If they answered within the next 6 months they were in the contemplation phase. If they answered they do not intend to change at all they were in the precontemplation phase.

3.2.7 Participation in Behavioral and Lifestyle Treatment Options Questionnaire

The Participation in Behavioral and Lifestyle Treatment Options Questionnaire (Appendix E) was a measure designed by the investigator to ascertain whether or not participants participated in the treatment options that were recommended to them during Phase 2, detailed below. For each treatment option the participants were asked to indicate on a 5-point Likert scale how beneficial they found the treatment option, one being not very beneficial to five being very beneficial; how well did it fit with them personally, one being not at all to five being very much so; if their knowledge of the treatment option changed, one being not at all to five being very much so; and their frequency and duration of participation. The stages of change algorithm was also used to assess whether or not their stage of change for each treatment option had changed.

3.3 Study Design & Procedure

The study consisted of three individual assessment phases conducted over a period of approximately six weeks. A description of all study procedures is detailed below.
3.3.1 Procedure

**Informed Consent and Study Instructions.** Participants were recruited via Facebook, Facebook ads, email, and on national Internet-based message and support boards. For each of these recruitment methods, participants were provided a brief description of the study and given instructions for logging onto a secure website wherein all data collection took place. At their earliest convenience, participants entered the website and began the first assessment phase.

**Assessment 1.** During the first assessment phase, participants were welcomed to the study and presented with the Informed Consent document (Appendix F). In that this was an online investigation, participants indicated their understanding of the information contained in the document and provided their consent by continuing to the remainder of the website. If the participant declined participation, they could close their web browser at any time.

At this point, the participant was asked to complete a brief demographics questionnaire, the OQ-45, HRQOL-14, and the Receptivity of Online Information measure. Upon providing this information participants were presented with and asked to provide information related to the Behavioral and Lifestyle Treatment Options Booklet (see Appendices A-D).

Once all of the aforementioned measures were completed, the participant was thanked for their involvement and asked to provide a valid e-mail address to which study materials (i.e., behavioral and treatment recommendation information detailed below) and instructions for their continued participation were delivered. At this point, the participant
was told that Phase 1 was complete and that they would be contacted by the researcher (via e-mail) within 48 hours. The time required to complete participation in the first phase of the study was approximately 30 minutes.

**Construction of Behavioral and Treatment Recommendations Information.**

Based upon responses given by participants during the first assessment phase, behavioral and treatment recommendation information was constructed prior to the onset of the second assessment phase. Given that information requested during Phase 1 involved multiple response options, messages contained within the recommendation information was created for all possible answers. Based upon the responses of the participant, the recommendation information was tailored to the characteristics, responses, and individual needs of the participant. This tailored information was merged into an Adobe Acrobat (.pdf) document that was e-mailed to the participant.

This information was presented as a pdf file for two reasons. First, regardless of computer operating platform that was used by the study participant (e.g., Microsoft Windows or Apple), the Adobe format maintained consistent formatting and file integrity. Second, the only software required to view (and print) the pdf documents was provided free from Adobe Systems Incorporated. While it is likely that study participants already had the Adobe software installed on their computer, instructions were provided to study participants on how to download and install this software, if needed.

Participants were randomly selected to receive either materials tailored to them individually or a generic (non-tailored equivalent). Generic materials were constructed to match the tailored materials in both appearance and content. While the tailored materials
were constructed based upon responses made by the participant during the first
assessment phase, the generic materials were the same for all participants in the non-
tailored treatment group. To ensure equivalence between tailored and non-tailored
communication messages, both presentations contained an approximately equal number
of words, the same graphic images, the same font and style of text.

Based on responses given by the participant to the aforementioned measures they
were provided an output with recommendations of treatments. Participants in the tailored
treatment group were given an output that matched their needs based on the Stages of
Change questions and the Behavioral and Lifestyle Treatment Options Booklet. If the
participant rated a treatment option as four or higher in the booklet, that treatment was
recommended to them. If they endorsed themselves in the Pre-Contemplation or
Contemplation stage their output was psychoeducation about the various treatment
options. If they endorsed themselves in the Planning or Action stage their output
provided a list of treatment option recommendations.

Depending upon format condition, either the tailored or non-tailored
recommendation materials (in .pdf format) were sent to the e-mail address provided by
the participant in Phase 1. Also included in this e-mail was a hyperlink to the Adobe
corporation website where they could download and install the Adobe reader software if
needed. The participant was asked to review the recommendation materials presented to
them. Within the body of this e-mail was a hyperlink to a second secure study website
wherein the participant could continue their participation.
**Assessment 2.** After participants entered the second secure website, they were asked to respond to a series of questions aimed at determining their reaction to the materials that they were provided (Appendix G). Questions in this assessment were used to determine first, their initial reaction to the materials (application to them personally, attractiveness of the materials, usefulness of the materials, etc.), and second, their likelihood of engaging in the recommendations presented therein. Also, a brief questionnaire was presented (Appendix H) to determine the amount of information gained through exposure to the recommendation materials.

Upon completion of this second assessment phase, participants were thanked for their continued participation and they were told that they would be contacted again in approximately 6 weeks for a third study assessment phase. The time required to complete this second assessment phase was approximately 30 minutes.

**Assessment 3.** Approximately 6 weeks after submitting responses in Phase 2, participants were contacted via e-mail and were directed to a third secure study website. Upon entering the study site, participants were presented with and asked to complete the Participation in Behavioral and Lifestyle Treatment Options Questionnaire (Appendix E). Following completion of this measure, participants were re-administered the OQ-45 and CDC-HRQOL measures.

This third assessment phase was used to measure whether or not the participant completed the treatments that were recommended to them, if their quality of life has improved, what stage of change they were currently, and a qualitative response regarding their experience with the program.
Upon completion of these assessments, the participants were thanked for their participation throughout the research study and were informed their participation in the study is now complete. The third assessment phase took approximately 15 minutes to complete.
RESULTS

4.1 Statistical Analysis of the Data

A total of 27 participants completed Phase I of the intervention, 17 participants completed Phase II of the intervention, and 16 completed Phase III of the intervention. Descriptive statistics were conducted to examine demographic variables of the sample, such as, gender, age, ethnic background, marital status, income, education, employment, smoking status, comorbid medical conditions, spirituality, and mental health. Chi-square analysis and independent-samples t-tests were utilized to assess the study hypotheses. Finally, exploratory analyses were conducted to health related quality of life and overall quality of life pre and post intervention and knowledge retention and receptivity to online information for the tailored and non-tailored treatment groups.

4.2 Descriptives

Of the participants from Phase I of the intervention, 66% were male, 33% were female. The mean age was 64. The ethnic background was 82% Caucasian, 4% Latino/a, 4% African American, and 10% identified as more than one race. Over 70% of the participants were married, 15% identified as partnered and the other 15% were widowed or divorced; 82% reported having children, 17% were childless. The majority, 44%, completed some college, 19% completed a college or graduate degree, and 37% completed some or all of high school. The majority, 22% identified as having a middle class income of $40-60,000/year, the second highest, 19%, identified in the highest income bracket, <$100,000. The majority, 62% of participants identified as spiritual and 70% of those who identified as spiritual reported that spirituality had a positive impact on
their health. The majority of participants, 82%, identified as non-tobacco users, of those that were current smokers, 29% had attempted to quit in the past. The majority, 54%, of participants were retired, 33% identified as working, and 13% identified as unemployed. The mean years since their last heart attack was 4.3, 32% had experienced multiple heart attacks, 41% had a comorbid medical condition, and 15% had a comorbid mental health condition.

4.3 Hypotheses

The purpose of this study was to assess whether participants whose cardiac treatment recommendations were tailored to their individual needs and stage of change would be more likely to participate in the cardiac rehabilitation treatments that were recommended to them than those participants whose cardiac treatment recommendations were not tailored to their individual needs or stage of change.

4.3.1 Primary Hypothesis

A two-way contingency table, chi-square, analysis was utilized to determine the effectiveness of tailoring participant’s treatment recommendations with two levels (tailored or non-tailored) compared to participation with two levels (yes, they did participate in treatment or no, they did not participate in treatment). The null hypothesis was that tailoring cardiac rehabilitation treatment recommendations would have no effect on whether the participant participates in the recommended treatment.

Outliers were assessed using z-scores. Normality was assessed by making sure the expected value of each cell is greater than five; 25% of the cells or less can have expected values less than five for normality to be assumed. In that 75% of the cells had
expected values less than five, normality was not assumed, thus a nonparametric test was used. There was not a significant difference between groups; tailoring cardiac rehabilitation treatment recommendations to the participant did not have a significant effect on whether the participant participates in the treatment, $x^2(1) = 0.837, p=0.36$.

4.3.2 Secondary Hypotheses

Secondary Hypothesis To assess the secondary hypothesis, that treatment identification would be significantly greater for those who participated in the treatment as recommended, an independent-samples t-test was utilized. The null hypothesis was that there would be no difference in treatment identification between those who followed their treatment recommendation and those who did not.

Normality, independence, and homogeneity of variance were assessed. Equality of variance was not assumed, due to Leven’s Test for Equality of Variances, $F=3.03, p=0.109$. Based on the corresponding t-test analysis, the null hypothesis was not rejected; there was not a significant difference in treatment identification between treatment recommendation groups, $t (15) = -0.425, p=0.225$.

Secondary Hypotheses To assess the other secondary hypothesis, that there would be a significant difference post-intervention in the health-related quality of life for the tailored treatment group compared to the non-tailored treatment group, an independent-samples t-test was utilized. The IV for the t-tests was categorical i.e., tailored or non-tailored treatment group and the DV was continuous i.e. quality of life as measured by the participant’s CDCHRQOL-14 score.
Normality, independence and homogeneity of variance were assessed. Normality and equality of variance were not assumed, due to the non-significance of Kolmogorov-Smirnov test of normality, $p=0.20$ and Levine’s Test for Equality of Variances, $F=2.75, p=0.123$. The null hypothesis was not rejected; there was not a significant difference in health-related quality of life post-intervention between the tailored treatment group and the non-tailored treatment group, $t(15)=-1.86, p=0.88$.

4.4 Exploratory Analyses

4.4.1 Receptivity to Online information and Knowledge Retention

Differences between the tailored treatment groups receptivity to online information, ($M=27$), and the non-tailored treatment groups receptivity to online information, ($M=26$) were assessed. This difference was non-significant, $t(25) = -0.441, p=0.663$. The assessment of the knowledge retained from the psychoeducation of the treatment recommendations also did not differ between the tailored ($M=6$) and non-tailored ($M=6$) groups, $t(15)= 0.000, p=1.00$.

4.4.2 Quality of Life

Differences between the tailored treatment groups pre-intervention health-related quality of life, ($M=44$), and post-intervention, ($M=35$), were assessed. There was not a significant difference in health-related quality of life for the tailored treatment group, pre-posttest, $t(5)=-0.298, p=0.777$. Further, differences between the non-tailored treatment groups pre-intervention health-related quality of life, ($M=90$), and post intervention, ($M=92$), was assessed. There was not a significant difference in health-related quality of
life for the non-tailored treatment group, pre-posttest, $t(8)=-2.148, \ p=0.064$. Meaning, the perceived health-related quality of life did not change significantly for either group.

Differences between the overall quality of life for the tailored treatment group, pre-intervention, ($M=79$), and post-intervention, ($M=104$), was assessed. There was a significant difference in the perceived overall quality of life for the tailored treatment group, pre-post test, $t(5)=-3.822, \ p=0.012$. Further, differences between the overall quality of life for the non-tailored treatment group, pre-intervention, ($M=86$), and post-intervention, ($M=110$), was assessed. There was not a significant difference in the perceived overall quality of life for the non-tailored treatment group, pre-posttest, $t(8)=-2.148, \ p=0.064$. Meaning the overall quality of life for the tailored treatment group significantly improved, while the non-tailored treatment group’s quality of life did not significantly improve.
DISCUSSION

Several conclusions can be made from the results of this study. First tailoring treatment recommendations to the individual participant, based on their individual needs and stage of change, did not impact participation in treatment recommendations. Second tailoring treatment recommendation to the participant did not significantly improve participant’s perceived health related quality of life.

Even though the hypotheses were not supported, those in the tailored treatment group had a better perceived health-related quality of life, pre and post intervention, and their perceived overall quality of life significantly improved pre and post intervention. This replicates the findings of the American Heart Association’s Heart Profiler initiative, that tailoring individual’s treatment options and education regarding treatment options increases their awareness and likelihood of discussing those options with a healthcare provider (Spring et al, 2013).

However, the findings in this study should be interpreted cautiously. There were multiple limitations to this study, most importantly, the low sample size, large attrition rate, 41%, and homogeneity of the sample. Although one of the advantages of a chi-square analysis is the ability to utilize a smaller sample size, it is still important to have a larger, more heterogeneous, sample to make real world generalizations from the data.

Another limitation is the homogeneity of the sample, with a disproportionate percentage of older white men. Traditional cardiac rehabilitation programs are more highly utilized by white men (Heid & Schmelzer, 2004). The benefits of a tele-health intervention, tailored to the individual, include decreases in time and distance barriers of
traditional cardiac rehabilitation programs thus better meeting the participant’s individual needs, especially for those who are less likely to access healthcare (Artinian, 2007; Brennan, Moore, Bjorsdottir, Jones, Visovsky, & Rogers, 2001). Since this sample was mostly white men, who are more likely to access cardiac rehabilitation programs, the data may not be reflective of the full benefits of tailored, tele-health interventions for a diverse population. A heterogeneous sample with a more representative sample of the general population, including more women and people of color may have indicated different results.

The high attrition rate from Phase I to Phase III is also a significant limitation of the study. One hypothesis for the high attrition rate is change behavior of the participants. All participants who completed Phase 3 had made some type of change in moving towards participating in their treatment recommendations e.g. calling their doctor, researching online; therefore, there is a possibility those who did not complete Phase 3 may not have made any changes in engaging in their treatment recommendations.

Another possible limitation was that the exclusion criteria was changed during data collection from having a myocardial infarction in the last six months to ever having a myocardial infarction. This was done due to the difficulty recruiting individuals to participate in the study. The average length of time between engagement in the intervention and the participant’s last myocardial infarction was 4.3 years. This is a possible limitation because research shows that, acutely, after a significant health-related event, participant’s motivation to change is highest and over time motivation to change decreases (Boudreaux, Baumann, Carmargo, O’Hea & Ziedonis, 2007). Another
possibility is that changes in health behaviors may have already been made prior to engagement in the intervention, resulting in non significant results.

Future research should replicate this study to assess if a tailored intervention, matched to stage of change and individual’s needs would have significant differences with a larger, more heterogeneous sample to obtain more accurate results. Recruitment, in partnership with the American Heart Association, or a larger organization with increased access to individuals in the acute phase, post myocardial infarction, would most likely obtain more clarity than the current study was able to obtain. A tele-health approach should be utilized as it can include those individuals who are less likely to access healthcare, less likely to attend traditional cardiac rehabilitation and become non-adherent due to time and distance barriers that can cause difficulty accessing healthcare. By recruiting these individuals it increases the heterogeneity of the sample and increases likelihood of increasing behavior change for those who may have been less likely to engage in traditional healthcare settings.

Future research can also improve the intervention by increasing the motivational interviewing interventions for those participants who are in precontemplation, contemplation, or planning stages of change or post-intervention with those participants who did not participate in the treatment recommendations provided to them. The American Heart Association recommends utilizing motivational interviewing to increase behavior change to improve cardiovascular health (Spring et al, 2013). Therefore, a tele-health intervention utilizing an increase in interaction with a healthcare professional, such as telephone, online chat room, email, or other communication in which the health professional is providing more motivational interviewing interventions may increase
behavior change and increase engagement in health-related behaviors. This may also be beneficial post-intervention with an interview with the health professional assessing barriers to health behavior change and utilizing motivational interviewing to motivate the participant to move into more active stages of change to improve health and health-related quality of life.

A growing body of research in chronic illness care models is focused on assessing patient activation, as activation is a central component of individuals functioning, rather than utilizing predictive models of a single behavior, such as stages of change or locus of control (Hibbard, Stockard, Mahoney, & Tusler, 2004). The Patient Activation Measure (PAM) was developed to assess individual’s level of activation based on different elements of knowledge, skill and confidence for self-management (Hibbard, Stockard, Mahoney, & Tusler, 2004). As stated previously, there was a high attrition rate for this study, assessing the individual’s level of activation may be a better assessment of engagement in health behavior change, and the intervention can be tailored according to the person’s level of activation, which may increase the likelihood of health behavior change and completion of the study.

The American Heart Association recommends tailored treatment, which meet the individual’s needs to improve cardiovascular disease (Delgado, Costigan, Wu, & Ross, 2003). This tele-health intervention, if found to be beneficial, could also be utilized for other cardiovascular diseases to improve health and engagement in health behaviors. Tele-health interventions have been found to be beneficial for chronic disease management, in general (Hersh et. al., 2001). Replication of this study, in light of the detailed limitations, stands to serve as an important step towards improving health and
increasing engagement in health behavior with individuals who are diagnosed with a host of chronic diseases.
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APPENDICES

Appendix A

DEMOGRAPHIC INFORMATION QUESTIONNAIRE

(NOTE: all information will be kept strictly confidential)

Date: __________

Sex:  □ Male    □ Female

Age: __________  Height: _______  Weight: _______

Race/Ethnicity: □ White/Caucasian □ Hispanic/Latino □ Native American
Indian (check all that apply) □ Asian □ African American □ More than one race
□ Other:_________

Marital Status: □ Married/Committed partnership □ Widowed
□ Living with partner □ Divorced/Separated
□ Single/never married

Children: □ Yes □ No  If yes how many? ______

Highest grade completed in school: □ Some high school □ High school diploma
□ Some college □ College degree
□ Graduate education

Household income: □ < $20,000 □ $20-40,000 □ $40-60,000
□ $60-80,000 □ $80-100,000 □ > $100,000

Do you currently smoke/chew tobacco? □ Yes □ No

If yes, have you previously attempted quitting? □ Yes □ No

Are you currently: □ Working full-time □ Working part-time □ Volunteer
□ Retired □ Unemployed □ Other

Have you had a heart attack? □ Yes □ No

If so, when was your last heart attack?: ________________________________

Have you experienced multiple heart attacks? □ Yes □ No

If so, how many?: _______________  When?: _______________
Please check if you have any of the following disorders:

- Heart Failure
- Cancer
- Hypertension
- Other
- Diabetes
- Chronic Obstructive Pulmonary Disease

Do you identify yourself as spiritual? □ Yes □ No

(If Yes, ) Do you feel that your spirituality has a positive impact on your health? □ Yes □ No

Are you currently taking medication or receiving treatment for a mental illness?
□ Yes □ No

If yes, what is your diagnosis? ____________________________
Appendix B

CDC Health Related Quality of Life-14

These questions are about your health in general, and also specifically during the past 30 days, please answer to the best of your ability.

1. Would you say that in general your health is:
   a. Excellent
   b. Very Good
   c. Good
   d. Fair
   e. Poor
   f. Don’t know/not sure

2. Now, thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure
4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure

5. Are you LIMITED in any way in any activities because of any impairment or health problem?
   a. yes
   b. no (if no skip to question 10)
   c. Don’t know/not sure (skip to question 10)

6. What is the MAJOR impairment or health problem that limits your activities?
   a. Arthritis/rheumatism
   b. Back or neck problems
   c. Fractures, bone/joint injury
   d. Walking problem
   e. Lung/breathing problem
   f. Hearing problem
   g. Eye/vision problem
   h. Heart problem
   i. Stroke problem
   j. Hypertension/high blood pressure
   k. Diabetes
1. Cancer

m. Depression/anxiety/emotional problem

n. Other impairment/problem

o. Don’t know/not sure

7. For HOW LONG have your activities been limited because of your impairment or health problem?

   a. Days

   b. Weeks

   c. Months

   d. Years

   e. Don’t know/not sure

8. Because of any impairment or health problem, do you need the help of other persons with your PERSONAL CARE needs, such as eating, bathing, dressing, or getting around the house?

   a. Yes

   b. No

   c. Don’t know/not sure

9. Because of any impairment or health problem, do you need the help of their persons in handling your ROUTINE needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?

   a. Yes

   b. No

   c. Don’t know/not sure
10. During the past 30 days, for about how many days did PAIN make it hard for you to do your usual activities, such as self-care, work, or recreation?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure

11. During the past 30 days, for about how many days have you felt SAD, BLUE, or DEPRESSED?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure

12. During the past 30 days, for about how many days have you felt WORRIED, TENSE, or ANXIOUS?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure

13. During the past 30 days, for about how many days have you felt you did NOT get ENOUGH REST or SLEEP?
   a. (drop box for # days 1-30)
   b. None
   c. Don’t know/not sure

14. During the past 30 days, for about how many days have you felt VERY HEALTHY AND FULL OF ENERGY?
   a. (drop box for # days 1-30)
   b. None
c. Don’t know/not sure
Appendix C

Receptivity to Online Information

This is a questionnaire to gain information on your perceptions and receptivity to online medical information and treatment. Please read and answer True, meaning you agree with the statement, or False, meaning you do not agree with the statement, for each question.

1. I would benefit if there were more online medical programs.
   □ True □ False

2. I believe that I can have the same outcome in an online cardiac rehabilitation program as in a traditional cardiac rehabilitation program.
   □ True □ False

3. I believe that I can learn the same amount in an online cardiac rehabilitation program as in a traditional cardiac rehabilitation program.
   □ True □ False

4. I prefer an online cardiac rehabilitation program to a traditional cardiac rehabilitation program.
   □ True □ False

5. If a cardiac rehabilitation program was to offer both traditional and online learning methodologies, I would learn better through the online portion.
   □ True □ False

6. Most people believe that online learning is more effective than traditional methodologies.
   □ True □ False

7. I would feel comfortable participating in cardiac rehabilitation online.
8. An online cardiac rehabilitation program makes me uncomfortable.

9. I prefer an online cardiac rehabilitation program to traditional cardiac rehabilitation programs.

10. I believe that I can learn more or would learn more through an online cardiac rehabilitation program than through traditional cardiac rehabilitation program.

11. Utilization of an online cardiac rehabilitation program requires significant changes by a medical patient.

12. An online cardiac rehabilitation program does not offer any advantages to me.

13. I would like to have more rehabilitation given using the online methodology.

14. An online cardiac rehabilitation program enables me to participate more than the traditional methodology in six weeks.

15. It is difficult to participate in an online cardiac rehabilitation program.
16. An online cardiac rehabilitation program enables me to participate more frequently than traditional cardiac rehabilitation programs.

□ True □ False

17. An online cardiac rehabilitation program works well with my schedule

□ True □ False

18. An online cardiac rehabilitation program saves me time.

□ True □ False
Appendix D

Knowledge Retention

You will be asked some questions based on the cardiac rehabilitation information that was presented to you previously. Please answer each question to the best of your knowledge.

1. Members of social support groups have the opportunity to
   a. receive and provide support to other individuals with cardiac-related health problems
   b. use relaxation training, deep breathing and imagery to cope with stress
   c. learn how to eat a balanced and nutritional diet
   d. meet one-on-one with a counselor

2. Exercise is designed to increase exercise capacity and improve physical well-being
   a. True
   b. False

3. Stress management
   a. has been shown to increase an individual’s level of stress
   b. uses coping strategies such as meditation to manage stress
   c. is not helpful after a heart attack
   d. is an adjunct to other standard treatment options

4. Diet modification can
a. help individuals quit smoking
b. increase the need for surgery
c. reduce cholesterol
d. decrease cardiac functioning

5. Smoking cessation programs emphasize
a. the health benefits of quitting smoking
b. how to prevent relapse
c. how to quit smoking
d. all of the above

6. Individual counseling aides in coping with stress and relationship/lifestyle changes after a heart attack
a. True
b. False

7. Complementary and Alternative Medicine
a. is an adjunct or addition to other standard treatment options
b. can include herbal medicine, yoga, or acupuncture
c. is sought out on an individual basis to best suit your needs
d. all of the above
Appendix E

Behavioral and Lifestyle Treatment Options after a Myocardial Infarction

This is a booklet providing a brief overview of some common treatment options for patients who have recently experienced a myocardial infarction (heart attack). Each page of the booklet outlines a different form of treatment that enhances the adaptation to experiencing a heart attack and improves physical and emotional well-being.

The purpose of this study is to give information on treatment options available after a myocardial infarction for you to participate in. Please answer as honestly and effectively as you can. Based on what treatment options you endorse recommendations will be made to you accordingly.

On the bottom of each page, after the description of the treatment is given, there will be four questions, as seen below. Please answer each question pertaining to you for each treatment.

Please check the number, on a scale from one to five, for each specific treatment. One being very unlikely, meaning you would not participate in this treatment. Five being very likely, meaning you would participate in this treatment.

Would you identify this as a behavior you already participate in?
☐ Yes    ☐ No

If you answered **YES**, how long have you tried to maintain this behavior?
☐ Within the past week    ☐ Within the past month
☐ Within the past 6 months    ☐ 6 months or longer

If you answered **NO**, do you intend to change your behavior?
☐ Within the next week    ☐ Within the next month
☐ Within the next 6 months    ☐ Not at all
What is your readiness for participating in this treatment option?

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If offered this form of treatment, how likely would it be that you would participate in it?

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If offered this form of treatment, how committed would you be to participate in it?

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If offered this form of treatment, how determined would you be to participate in it?

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Peer-led Social Support Group

This approach is aimed at helping patients adjust to the lifestyle changes that are associated with a heart attack and share with others who have similar experiences. Members of the social support group have the opportunity to provide and receive support from other members of the group. Most often support groups are held 1-2 sessions per week for three to four months after discharge.

Would you identify this as a behavior you already participate in?

☐ Yes ☐ No

If you answered YES, how long have you tried to maintain this behavior?

☐ Within the past week ☐ Within the past month

☐ Within the past 6 months ☐ 6 months or longer

If you answered NO, do you intend to change your behavior?

☐ Within the next week ☐ Within the next month

☐ Within the next 6 months ☐ Not at all
Subject No. _____

What is your readiness for participating in this treatment option?

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If offered this form of treatment, how committed would you be to participate in it?
If offered this form of treatment, how determined would you be to participate in it?

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Exercise Training

This approach is designed by a trained professional and includes some form of physical activity such as aerobic exercise, designed for the patient’s individual needs. It is aimed at increasing exercise capacity to improve physical well-being. Exercise training programs usually consist of meeting with a trained professional, individually, 2-3 times per week for three to four months after being discharged.

Would you identify this as a behavior you already participate in?

☐ Yes ☐ No

If you answered YES, how long have you tried to maintain this behavior?

☐ Within the past week ☐ Within the past month
☐ Within the past 6 months ☐ 6 months or longer

If you answered NO, do you intend to change your behavior?

☐ Within the next week ☐ Within the next month
☐ Within the next 6 months ☐ Not at all
What is your readiness for participating in this treatment option?

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If offered this form of treatment, how likely would it be that you would participate in it?

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If offered this form of treatment, how committed would you be to participate in it?

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Diet Modification

This approach is designed by a trained professional, such as a physician, nurse or nutritionist and teaches individuals how to maintain a heart healthy diet. Diet modification programs are aimed at lowering cholesterol. Normally, patients have three to four sessions with a trained professional to learn about a heart healthy diet and are then instructed to maintain this diet on their own.

Would you identify this as a behavior you already participate in?

☐ Yes  ☐ No

If you answered YES, how long have you tried to maintain this behavior?

☐ Within the past week  ☐ Within the past month
☐ Within the past 6 months  ☐ 6 months or longer
If you answered **NO**, do you intend to change your behavior?

- □ Within the next week
- □ Within the next month
- □ Within the next 6 months
- □ Not at all

What is your readiness for participating in this treatment option?

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Smoking Cessation Program

This approach is aimed at aiding patients in reducing and quitting their smoking habits. Programs emphasize the health benefits of quitting smoking, how to prevent relapse, and, if relapse does occur, how to quit smoking. Smoking cessation programs include nicotine replacement therapy, which uses other forms of nicotine such as the patch, gum, nasal spray, or medication to replace nicotine use through smoking, and support group sessions, led by a trained professional to aid in coping with quitting smoking.

Would you identify this as a behavior you already participate in?

□ Yes □ No

If you answered YES, how long have you tried to maintain this behavior?

□ Within the past week □ Within the past month
□ Within the past 6 months □ 6 months or longer

If you answered NO, do you intend to change your behavior?

□ Within the next week □ Within the next month
□ Within the next 6 months □ Not at all
What is your readiness for participating in this treatment option?

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Individual Counseling

This approach is aimed at reduction of distress through individual meetings with a trained professional, such as a counselor. Counselors provide support and education after experiencing a heart attack on an individual basis to the patient and attempt to aid patients in coping with lifestyle and/or relationship changes resulting from a heart attack. Counseling sessions usually consist of 1-2 sessions per week for three to four months following discharge.

Would you identify this as a behavior you already participate in?

□ Yes  □ No

If you answered YES, how long have you tried to maintain this behavior?

□ Within the past week  □ Within the past month
□ Within the past 6 months  □ 6 months or longer

If you answered NO, do you intend to change your behavior?

□ Within the next week  □ Within the next month
□ Within the next 6 months    □ Not at all

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Stress Management

This approach provides skill training, such as relaxation techniques, to individuals aimed at reducing physical reactions to stress. Stress management is taught by a trained professional, such as a physician, nurse or counselor. Certain techniques include deep breathing, visualization, and deep muscle relaxation. Stress management can be taught individually or in group settings. Typically taught in 4-6 weekly sessions and then practiced on an individual basis by the patient.

Would you identify this as a behavior you already participate in?

☐ Yes       ☐ No

If you answered YES, how long have you tried to maintain this behavior?

☐ Within the past week       ☐ Within the past month
☐ Within the past 6 months   ☐ 6 months or longer

If you answered NO, do you intend to change your behavior?
Within the next week □
Within the next month □
Within the next 6 months □
Not at all □

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Complementary and Alternative Medicine

This approach involves the prescription of treatments that serve as an adjunct, or to compliment standard treatment options. Individuals often seek alternative medicines when they are seeking treatment in addition to standard treatment options given to them. Some alternative medicine treatments include herbal medicine, homeopathy, yoga and Chinese medicine. Patients seek out alternative medicines on an individual basis to best suit their needs.

Would you identify this as a behavior you already participate in?
- □ Yes
- □ No

If you answered YES, how long have you tried to maintain this behavior?
- □ Within the past week
- □ Within the past month
- □ Within the past 6 months
- □ 6 months or longer

If you answered NO, do you intend to change your behavior?
- □ Within the next week
- □ Within the next month
Within the next 6 months □ □ Not at all

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Have you previously participated in a cardiac rehabilitation program?

□ Yes □ No

If yes, please indicate which treatment options you have participated in. Please check all that apply:

□ Social Support Group

□ Exercise Training

□ Diet Modification

□ Smoking Cessation Program

□ Individual Counseling

□ Stress Management

□ Complementary and Alternative Medicine

Thank you very much for your participation in the study. If you feel that this booklet has not covered a treatment option you consider valuable during
cardiac rehabilitation please feel free to use the space below to write in your response. THANK YOU!
Appendix F

Behavioral and Lifestyle Treatment Options after a Myocardial Infarction

Six weeks ago you participated in an online survey of different treatment options that are available for patients who have recently experienced a myocardial infarction. Based on the information you provided recommendations were given regarding treatment options that would be helpful for you.

Presently, we would like to know what you have participated in during the last six weeks. For each treatment option you will be asked whether you participated in the treatment option. Please check yes or no. For each of the subsequent questions please circle one number on the scale from one to five. The next question is how beneficial you found this treatment; one being very unbeneficial, to five being very beneficial. The next question is how well this treatment fit with you personally; one being not at all to five being very good. The next question is if your knowledge of this treatment has changed; one being not at all to five being very much so.

How long have you participated in this treatment?

☐ Within the past week  ☐ Within the past month  ☐ Within the past 6 months
☐ 6 months or longer

If no, do you intend to participate in this treatment?

☐ Within the next week  ☐ Within the next month  ☐ Within the next 6 months
Identify the extent to which you participated in this treatment (check all that apply):

- Called Doctor/Cardiologist
- Made an appointment with my physician
- Discussed treatment considerations with my physician
- Found treatment or support resources
- Found treatment location
- Called treatment location for information
- Enrolled in treatment
- Went to first appointment
- Developed treatment plan
- Other

How often did you participate?

- More than once a week
- Once a week
- Once every other week
- Twice in the past 6 weeks
- Once in the past 6 weeks

When you did participate, for how long?

- Less than 15 minutes
- 15-30 minutes
- 30-45 minutes
- 45-60 minutes
- More than 60 minutes

How beneficial did you find this treatment?

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How well did this treatment fit with you personally?

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1. Peer-Led Social Support Groups

How long have you participated in this treatment?

☐ Within the past week  ☐ Within the past month  ☐ Within the past 6 months
☐ 6 months or longer

If no, do you intend to participate in this treatment?

☐ Within the next week  ☐ Within the next month  ☐ Within the next 6 months
☐ Not at all

Identify the extent to which you participated in this treatment (check all that apply):

☐ Called Doctor/Cardiologist  ☐ Made an appointment with my physician
☐ Discussed treatment considerations with my physician  ☐ Found treatment or support resources
☐ Found treatment location  ☐ Called treatment location for information
☐ Enrolled in treatment  ☐ Went to first appointment
☐ Developed treatment plan  ☐ Other

How often did you participate?

☐ More than once a week  ☐ Once a week  ☐ Once every other week
☐ Twice in the past 6 weeks  ☐ Once in the past 6 weeks
When you did participate, for how long?

- [ ] Less than 15 minutes
- [ ] 15-30 minutes
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- [ ] 45-60 minutes
- [ ] More than 60 minutes

How beneficial did you find this treatment?

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2. Exercise Training

How long have you participated in this treatment?

☐ Within the past week  ☐ Within the past month  ☐ Within the past 6 months
☐ 6 months or longer

If no, do you intend to participate in this treatment?

☐ Within the next week  ☐ Within the next month  ☐ Within the next 6 months
☐ Not at all

Identify the extent to which you participated in this treatment (check all that apply):

☐ Called Doctor/Cardiologist  ☐ Made an appointment with my physician
☐ Discussed treatment considerations with my physician  ☐ Found treatment or support resources  ☐ Found treatment location  ☐ Called treatment location for information  ☐ Enrolled in treatment  ☐ Went to first appointment  ☐ Developed treatment plan  ☐ Other

How often did you participate?

☐ More than once a week  ☐ Once a week  ☐ Once every other week
☐ Twice in the past 6 weeks  ☐ Once in the past 6 weeks
When you did participate, for how long?

- □ Less than 15 minutes
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- □ More than 60 minutes

How beneficial did you find this treatment?

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3. Diet Modification

How long have you participated in this treatment?

☐ Within the past week ☐ Within the past month ☐ Within the past 6 months
☐ 6 months or longer

If no, do you intend to participate in this treatment?

☐ Within the next week ☐ Within the next month ☐ Within the next 6 months
☐ Not at all

Identify the extent to which you participated in this treatment (check all that apply):

☐ Called Doctor/Cardiologist ☐ Made an appointment with my physician
☐ Discussed treatment considerations with my physician ☐ Found treatment or support resources
☐ Found treatment location ☐ Called treatment location for information ☐ Enrolled in treatment ☐ Went to first appointment
☐ Developed treatment plan ☐ Other

How often did you participate?

☐ More than once a week ☐ Once a week ☐ Once every other week
☐ Twice in the past 6 weeks ☐ Once in the past 6 weeks

When you did participate, for how long?
☐ Less than 15 minutes  ☐ 15-30 minutes  ☐ 30-45 minutes
☐ 45-60 minutes  ☐ More than 60 minutes

How beneficial did you find this treatment?

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4. Smoking Cessation Program

How long have you participated in this treatment?

☐ Within the past week  ☐ Within the past month  ☐ Within the past 6 months
☐ 6 months or longer

If no, do you intend to participate in this treatment?

☐ Within the next week  ☐ Within the next month  ☐ Within the next 6 months
☐ Not at all

Identify the extent to which you participated in this treatment (check all that apply):

☐ Called Doctor/Cardiologist  ☐ Made an appointment with my physician
☐ Discussed treatment considerations with my physician  ☐ Found treatment or support resources
☐ Found treatment location  ☐ Called treatment location for information
☐ Enrolled in treatment  ☐ Went to first appointment
☐ Developed treatment plan  ☐ Other

How often did you participate?

☐ More than once a week  ☐ Once a week  ☐ Once every other week
☐ Twice in the past 6 weeks  ☐ Once in the past 6 weeks
When you did participate, for how long?

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- [ ] 45-60 minutes
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How well did this treatment fit with you personally?

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Has your knowledge of this treatment changed?

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5. Individual Counseling

How long have you participated in this treatment?

☐ Within the past week  ☐ Within the past month  ☐ Within the past 6 months
☐ 6 months or longer

If no, do you intend to participate in this treatment?

☐ Within the next week  ☐ Within the next month  ☐ Within the next 6 months
☐ Not at all

Identify the extent to which you participated in this treatment (check all that apply):

☐ Called Doctor/Cardiologist  ☐ Made an appointment with my physician
☐ Discussed treatment considerations with my physician  ☐ Found treatment or support resources  ☐ Found treatment location  ☐ Called treatment location for information  ☐ Enrolled in treatment  ☐ Went to first appointment  ☐ Developed treatment plan  ☐ Other

How often did you participate?

☐ More than once a week  ☐ Once a week  ☐ Once every other week
☐ Twice in the past 6 weeks  ☐ Once in the past 6 weeks

When you did participate, for how long?
☐ Less than 15 minutes  ☐ 15-30 minutes  ☐ 30-45 minutes
☐ 45-60 minutes  ☐ More than 60 minutes

How beneficial did you find this treatment?

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6. Stress Management

How long have you participated in this treatment?

- [ ] Within the past week  
- [ ] Within the past month  
- [ ] Within the past 6 months
- [ ] 6 months or longer

If no, do you intend to participate in this treatment?

- [ ] Within the next week  
- [ ] Within the next month  
- [ ] Within the next 6 months
- [ ] Not at all

Identify the extent to which you participated in this treatment (check all that apply):

- [ ] Called Doctor/Cardiologist  
- [ ] Made an appointment with my physician 
- [ ] Discussed treatment considerations with my physician  
- [ ] Found treatment or support resources  
- [ ] Found treatment location  
- [ ] Called treatment location for information  
- [ ] Enrolled in treatment  
- [ ] Went to first appointment  
- [ ] Developed treatment plan  
- [ ] Other

How often did you participate?

- [ ] More than once a week  
- [ ] Once a week  
- [ ] Once every other week
- [ ] Twice in the past 6 weeks  
- [ ] Once in the past 6 weeks
When you did participate, for how long?

- □ Less than 15 minutes
- □ 15-30 minutes
- □ 30-45 minutes
- □ 45-60 minutes
- □ More than 60 minutes

How beneficial did you find this treatment?

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7. Complementary and Alternative Medicine

How long have you participated in this treatment?

□ Within the past week  □ Within the past month  □ Within the past 6 months
□ 6 months or longer

If no, do you intend to participate in this treatment?

□ Within the next week  □ Within the next month  □ Within the next 6 months
□ Not at all

Identify the extent to which you participated in this treatment (check all that apply):

□ Called Doctor/Cardiologist  □ Made an appointment with my physician
□ Discussed treatment considerations with my physician  □ Found treatment or support resources
□ Found treatment location  □ Called treatment location for information
□ Enrolled in treatment  □ Went to first appointment  □ Developed treatment plan  □ Other

How often did you participate?

□ More than once a week  □ Once a week  □ Once every other week
□ Twice in the past 6 weeks  □ Once in the past 6 weeks
When you did participate, for how long?

- □ Less than 15 minutes
- □ 15-30 minutes
- □ 30-45 minutes
- □ 45-60 minutes
- □ More than 60 minutes

How beneficial did you find this treatment?

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Thank you very much for your participation in the study. If you feel there is anything else you would like to add about your experience with this study please feel free to use the space below to write in your response. THANK YOU!
Appendix G

Informed Consent

<table>
<thead>
<tr>
<th>Pacific University</th>
<th>2043 College Way</th>
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<tbody>
<tr>
<td>Institutional Review Board</td>
<td>Forest Grove, OR 97116</td>
</tr>
<tr>
<td>Proposal to Conduct Human Subjects Research</td>
<td>FWA: 00007392</td>
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</table>

1. Study Title

Development of a Tele-Health Cardiac Rehabilitation Program: Working with the Client for Optimal Health

2. Study Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Kristin Tiernan, MS</th>
<th>Shawn Davis, PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role</td>
<td>Graduate Student Investigator</td>
<td>Faculty Advisor</td>
</tr>
<tr>
<td>Institution</td>
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<td>Pacific University</td>
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<tr>
<td>Program</td>
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<tr>
<td>Email</td>
<td><a href="mailto:Tier0383@pacificu.edu">Tier0383@pacificu.edu</a></td>
<td><a href="mailto:Davissh@pacificu.edu">Davissh@pacificu.edu</a></td>
</tr>
<tr>
<td>Telephone</td>
<td>(503) 352-7319</td>
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3. Study Invitation, Purpose, Location, and Dates

The goal of this research study is to investigate utilization of cardiac rehabilitation options.

The study is expected to begin August 2011, and to be completed by August 2012. All study information will be collected via the Internet and stored on a computer located at the School of Professional Psychology, Bldg. 2, Room 286, within the College of Health Professions, Pacific University.

4. Participant Characteristics and Exclusionary Criteria

To participate in this research study, you must be 18 years or older, have experienced a heart attack within the past six months, have access to a computer and a valid email address, and read English at a minimum 6th grade reading level. If you don’t meet these criteria, please exit the survey now.
5. Study Materials and Procedures

In this study, you will be asked to complete a brief demographic survey. Once this is complete, you will be presented several brief questionnaires with items regarding your health behaviors and attitudes towards health, readiness for behavior change, preferences for various Cardiac Rehabilitation treatments, receptivity to online information, and knowledge retention. If you agree to participate, you will be asked to complete a second assessment phase approximately 48 hours following your participation today and a third assessment phase six weeks from today. It should only take about 35 minutes to complete your participation in Assessment 1, 15 minutes in Assessment 2, and 20 minutes in Assessment 3.

6. Risks, Risk Reduction Steps and Clinical Alternatives

a. Unknown Risks:

It is possible that participation in this study may expose you (or an embryo or fetus, if you are or become pregnant) to currently unforeseeable risks.

b. Anticipated Risks and Strategies to Minimize/Avoid:

Your participation in this project involves no foreseeable risks. Although, some of the measures within the study may cause emotional discomfort, such as anxiety, worry, or stress, when filling out the survey. This could be due to the sensitive nature of, or feeling that you may not be able to participate in, the treatment considerations. If “heightened” emotional discomfort occurs, you should stop your participation immediately, by closing your web browser and contact the study researchers. All of the treatment considerations are standard cardiac rehabilitation treatment considerations, if you do feel any anxiety, worry, or stress about your participation, you may also consult with your physician. **You do not have to answer any question or engage in any task that you do not wish to perform.**

c. Advantageous Clinical Alternatives:

This study does not involve clinical alternatives.

7. Adverse Event Handling and Reporting Plan

The IRB office will be notified by the Faculty Advisor by the next normal business day if minor adverse events occur (e.g., psychological discomfort, unusual amount of participant dropout, or subject complaints about the experiment or conduct investigators) and will be handled as follows: Investigators will consult with the IRB about changes that may need to be made to the protocol or other changes deemed necessary to minimize any minor adverse events.

The IRB office will be notified by the Faculty Advisor within 24 hours if major adverse events occur (e.g., hospitalization, disability, events that are fatal or life threatening) and will be handled as follows: Investigators will immediately discontinue recruitment and discuss with the IRB office the best solution in order to minimize any and all adverse events.
8. Direct Benefits and/or Payment to Participants

a. Benefit(s)

There are no direct benefits to you for your participation in this study. Your participation, however, will allow researchers to gain a better understanding of how health behaviors are related to their cardiac health.

b. Payment(s) or Reward(s):

Not applicable.

9. Promise of Privacy

The records of this study will be kept private. Results from your participation will be available only to the researchers themselves. Your participation in this project is strictly confidential. If any publication or presentation of research findings results from this study, all identifying information will be removed.

10. Medical Care and Compensation In the Event of Accidental Injury

During your participation in this project it is important to understand that you are not a Pacific University clinic patient or client, nor will you be receiving complete medical care as a result of your participation in this study. If you are injured during your participation in this study and it is not due to negligence by Pacific University, the researchers, or any organization associated with the research, you should not expect to receive compensation or medical care from Pacific University, the researchers, or any organization associated with the study.

11. Voluntary Nature of the Study

Your decision whether or not to participate will not affect your current or future relations with Pacific University. There are no costs to you for your participation other than the time involved in completing the surveys. If you choose not to participate, you are free to withdraw at any time; withdrawal will not result in penalty. Participation in this project is voluntary and the only other alternative to this project is non-participation. If you decide to participate, you are free to not answer any question or withdraw at any time without prejudice or negative consequences.

12. Contacts and Questions

The researcher(s) will be happy to answer any questions you may have at any time during the course of the study. Complete contact information for the researchers is noted on the first page of this form. If you have any questions or concerns regarding this study or your participation, please contact Dr. Shawn Davis at (503) 352-7319. If you are not satisfied with the answers you receive, please call Pacific University’s Institutional Review Board, at (503) 352 – 2112 to discuss your questions or concerns further. All concerns and questions will be kept in confidence.

13. Statement of Consent
I have read and understand the above. All my questions have been answered. I am 18 years of age or over and agree to participate in the study. I have been offered a copy of this form to keep for my records.

Since this is an on-line survey, signatures cannot be obtained. By clicking “NEXT” I understand I will be taken to the study and that my continued participation in the survey denotes my consent. If I choose not to participate or to withdraw from participation, I can close the web page at anytime. I you do withdraw from participation in this study, any information collected to that point will be removed from all analyses.
Appendix H
Responses to Treatment Recommendations

Instructions
Please respond to each of the following questions by selecting the number that best reflects your opinion.

Would you consider the information contained in the treatment options materials engaging?

…….1………………..2.………………..3.………………..4.………………..5.…………
Not at all Engaging Neutral Very Engaging

Considering all aspects of the treatment options materials (e.g. border, layout, font, spacing, etc.), would you consider the treatment options materials attractive?

…….1………………..2.………………..3.………………..4.………………..5.…………
Not at all Attractive Neutral Very Attractive

How informative were the treatment options materials?

…….1………………..2.………………..3.………………..4.………………..5.…………
Not at all Informative Neutral Very Informative

Was there much information contained in the treatment options materials that was new to you?

…….1………………..2.………………..3.………………..4.………………..5.…………
Not Much Neutral Very Much
Were the treatment options materials clear?

…….1……………..2……………3……………4………………5…………
Not at all Clear Neutral Very Clear

Would you consider the treatment options materials “easy reading”?  

…….1……………..2……………3……………4………………5…………
Not at all Neutral Very

Were the treatment options materials interesting?

…….1……………..2……………3……………4………………5…………
Not at all Interesting Neutral Very Interesting

Did the information contained in the treatment options materials make you want to change your health behaviors?

…….1……………..2……………3……………4………………5…………
Not at all Neutral Very Much

How much did the information in the treatment options materials apply to you personally?

…….1……………..2……………3……………4………………5…………
Applied Very Little Neutral Applied Very Much

How much of the treatment options materials did you read?

…….1……………..2……………3……………4………………5…………
None at all Neutral All of it
In your opinion, how trustworthy was the information presented in the treatment options materials?

Not at all Trustworthy Neutral Very Trustworthy

If you had received the treatment options materials in your mailbox at home, would you have read it?

No Neutral Yes

How likely is it you will re-read the treatment options materials that were sent to you?

Not at all Likely Neutral Very Likely

When you read the treatment options materials, did you:

_____ Read them directly from the computer screen

_____ Print the materials and then read them

How likely are you to participate in these treatment options?

Not likely at all Not likely Possibly Very likely

In the space below, please describe as completely as possible the strategies or methods you used in learning the material presented in the healthy eating communication:
Appendix I

Cardiac Rehabilitation Treatment Recommendations

Thank you for participating in the study. Based on your responses to the battery of measures we have ascertained that:

- Social Support Group
- Exercise Training
- Stress Management
- Diet Modification
- Smoking Cessation program
- Individual Counseling
- Complementary and Alternative Medicine

are the Cardiac Rehabilitation options that best fit your needs, currently. Please contact your Cardiologist or Primary Care Physician to obtain information on where you can participate in these treatment options in your area.

In six weeks we will be contacting you to complete a final battery of measures, similar to the measures you completed previously. If at any time you have questions please do not hesitate to contact the investigator, Kristin Tiernan. Thank you for your time.
Appendix J

Cardiac Rehabilitation Treatment Considerations

Thank you for participating in the study. Based on your responses to the battery of measures we have ascertained that there are several Cardiac Rehabilitation treatment options that would fit your needs:

- Social Support
- Exercise
- Stress Management
- Diet Modification
- Smoking Cessation
- Individual Counseling
- Complementary and Alternative Medicine

Below is some more information on the benefits of these treatment options:

- Social Support: Cardiac patients who report social isolation and high levels of stress have four times the mortality risk than those who neither isolated nor suffering from stress. Social network size, frequency of social activity, group membership and perceived social support have been linked to mortality in patients after a heart attack. Members of social support groups have the opportunity to receive and provide support to other individuals with cardiac-related health problems. Social support groups have been shown to increase a participant's overall quality of life as well as physical and mental quality of life.

- Exercise: Regular physical activity, such as aerobic exercise, has been shown to increase functional capacity, lower blood pressure, lower cholesterol, and significantly reduce mortality after an MI. Research has shown that exercise aids long term rehabilitation after a heart attack. Exercise also has a significant impact on your mental well-being, it may decrease any depressive or anxiety symptoms you feel after a heart attack.

- Stress Management: Stress is a significant risk factor in heart disease and recurrent heart attacks. Stress management has been found to help with psychosocial recovery after a heart attack and significantly reduces the number of hospital visits after a cardiac event. Stress management includes relaxation training, deep breathing, meditation, imagery, and skills to cope with stress.

- Diet Modification: A balanced diet and nutrition has been found to reduce cholesterol in secondary prevention of heart disease. Diet Modification programs can increase physical
functioning, cardiac functioning and psychosocial well-being. Diet modification can reduce recurrent heart attacks and the need for surgery or angioplasty.

- Smoking Cessation: Individuals who quit smoking after a heart attack can reduce their risk of a recurrent heart attack by up to 50%. These programs aid in the reduction of current smoking habits and quitting smoking completely. Smoking cessation programs have been found to reduce mortality and cardiovascular disease risk.

- Individual counseling: Stress and mental illness can increase an individual’s risk for a recurrent heart attack. These programs aid in coping with stress and mental illness. Counseling has been shown to reduce mortality and cardiovascular related deaths.

- Complementary and Alternative Medicine: These types of treatments serve as an adjunct or in addition to other standard treatment options. This can include herbal medicine, homeopathy, yoga, or acupuncture. Complementary and alternative medicine supports greater psychological recovery and quality of life after a heart attack and can reduce mortality.

If you are interested, please contact your Cardiologist or Primary Care Physician to obtain information on where you can participate in these treatment options in your area.

In six weeks we will be contacting you to complete a final battery of measures, similar to the measures you completed previously. If at any time you have questions please do not hesitate to contact the investigator, Kristin Tiernan. Thank you for your time.