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Development and Evaluation of the Cardiac Exercise Health Belief Scale

Virginia R. McGinn
Grand Valley State University

DEVELOPMENT AND EVALUATION OF THE CARDIAC EXERCISE HEALTH BELIEF SCALE

by

Virginia R. McGinn

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Thesis Committee Members:

Katherine K. Kim, Ph. D., R.N.
Phyllis Gendler, Ph. D., R.N.,C.S..
James Scott, P.E.S.

ABSTRACT

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The purpose of the study was to develop and evaluate the Cardiac Exercise Health Belief Scale (CEHBS) which is based on the Health Belief Model. The CEHBS focuses on the concepts of benefits and barriers. Ninety post cardiac event subjects, 69 males and 21 females, were recruited from two Michigan hospitals during their hospital stay. The CEHBS was mailed to subjects six to eight weeks following discharge.

Cronbach alpha for the CEHBS benefits subscale was .90 and for the barriers subscale was .84. Content validity was established by expert review. During factor analysis all items did load on factors related to the HBM constructs of benefits and barriers. Discriminant function analysis correctly classified 70.0% cardiac exercise regimen compliant and noncompliant subjects by CEHBS benefits and barriers subscales. The psychometric analysis of the CEHBS gives support for reliability and validity of the instrument.

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CHAPTER I

INTRODUCTION

Coronary artery disease (CAD) is the leading cause of death among Americans. In 1991 an estimated 1.5 million people in the United States will have a myocardial infarction (MI) and more than 500,000 of them will die (American Heart Association [AHA], 1991). Many of the victims of CAD experience significant physiological, psychological and social disabilities. Treatment for those who have been diagnosed with CAD includes promotion of heart healthy lifestyle changes. Identified risk factors for CAD are heredity, advanced age, male sex, obesity, cigarette smoking, hyperlipidemia, stress, diabetes mellitus, gout, inactive lifestyle, Type A personality, and high caffeine consumption (AHA, 1991).

Compliance to recommended therapy for chronic disease requires a permanent alteration of lifestyle. Furthermore, even with diligent adherence to therapy, the patient will never be rewarded with a cure. It is therefore not surprising to find a consistently high incidence of non-adherence among chronic disease patients. Janz and Becker (1984) postulate that an individual's motivation to engage in health action is based on combined levels of perceived severity of a condition and perceived susceptibility to a condition. In addition, some stimulus is required to trigger the decision-making process. This stimulus is frequently referred to as a "cue to action". To ascertain the direction of action, individuals weigh the benefits of available

alternatives against the perceived costs (Cameron & Gregon, 1987).

Early research suggested the outcome of treatment in chronic illness is dependent upon the patient's responsibility for maintaining his regimen. The Health Belief Model (HBM) suggests that acceptance of responsibility depends upon the patient's perspective or "it is the world of the perceiver that determines what he will do and not the physical environment" (Rosenstock, 1974, p. 329). Attitudes and beliefs of the individual must be understood in order to understand and predict adherence behavior.

Cardiac rehabilitation attempts to meet the challenge of promoting sustained lifestyle change to reduce individual risk. Cardiac rehabilitation programs focus on lifestyle behavior changes which include dietary modification, regular physical exercise, cessation of smoking, stress management, and control of complicating disease processes such as diabetes and hypertension.

Medically prescribed and supervised exercise is an essential component of a cardiac rehabilitation program for patients after a myocardial infarction or coronary artery bypass graft (CABG) surgery or angioplasty or who have angina pectoris. The potential physiologic and psychologic benefits of an exercise program vary dependent upon the intensity, frequency, and duration of exercise as well as adherence to the recommended program. Cardiovascular exercise is exercise that keeps the heart rate raised for twenty to thirty minutes and is performed three to four times a week (AHA,1993).

Health-related behaviors have been of interest to health care providers for many years. Melnyk (1988) defines health related behaviors as "any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or

detecting it in an asymptomatic stage." Health related behaviors which require the intervention of a skilled provider are of particular interest in the cardiac rehabilitation environment. Understanding the motivation of individuals who do or do not undertake a health promoting activity or behavior enables the health care provider to define and focus interventions on patient perceptions. It is hoped that focusing interventions on specific health related perceptions will enhance the probability that an individual will participate in a health-related behavior.

The Health Belief Model (HBM) addresses psychosocial determinants of health behavior and compliance to a prescribed regimen. The HBM has been used as a research basis to understand the decision making process an individual uses to enter into and adhere to a prescribed treatment, such as is recommended in cardiac rehabilitation. Adherence to the treatment recommendations of cardiac rehabilitation requires behavior change by the participants. To help us understand and predict what motivates patients to change behavior, we need a reliable and valid instrument which measures the significant concepts of the HBM in the cardiac population. Information obtained from a reliable, valid instrument would allow health care providers to focus interventions and optimize patient compliance to recommended behavior changes.

Utilization of the HBM to evaluate health behavior has been used extensively with multiple populations. In general, there exists a need to refine and standardize tools used to measure HBM components (Janz & Becker, 1984). Studies which have looked at the cardiac population have produced results which suggest a need for further development of a research tool which reliably and validly predicts the significant health perceptions of cardiac patients and ultimately influences their

adherence outcome behavior in either a positive or negative manner. There are, however, gaps in research both with the cardiac population and utilization of valid HBM instruments. These gaps in research support the need for continued development of reliable and valid measurement tools of the HBM.

Inevitably, cardiac patients will have multiple health related experiences. As a result of these varied experiences, cardiac patients develop a variety of health-related perceptions and beliefs which influence their behavior. Examination of these perceptions and beliefs will help us understand patient's decisions with regard to compliance or noncompliance to prescribed treatment. Nursing interventions can then be focused appropriately on the patient's decision making process utilizing knowledge of their health related beliefs and perceptions. To do this we need a reliable and valid measure of an individual's health beliefs.

Purpose

The purpose of this study is to develop and evaluate the Cardiac Exercise Health Belief Scale (CEHBS) which is based on the Health Belief Model. The CEHBS focuses on the concepts of benefits and barriers. The limited amount of research focused on the cardiac population and the failure to adequately measure the concepts of benefits and barriers in the HBM demand further research tool development for this population and HBM constructs.

CHAPTER II

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Conceptual Framework

A conceptual framework which has been used to explain a patient's adherence behavior to a prescribed regimen is the HBM. The Health Belief Model was introduced in the 1950's by Hochbaum, Kegeles, Levanthol and Rosenstock. These original authors of the HBM were concerned with such issues as: a) Why is the rate of noncompliance with health and medical care recommendations so high? b) Why do some people seek health care while others do not? c) How can health related behavior be changed? d) What factors prevent or interfere with people complying with health care recommendations? (Mikhail, 1981).

The four original variables of the HBM were: perceived susceptibility to a disease, perceived seriousness of a disease, perceived benefits of taking action, and perceived barriers to taking action (Rosenstock, 1974). The psychological and behavioral theories from which the HBM is derived hypothesize that behavior depends primarily upon two variables: "(1) the value placed by an individual on a particular goal and (2) efficacy, the individuals estimate of the likelihood that a given action will achieve that goal " (Janz & Becker, 1984, p. 2).

In 1974, Becker added health motivation to the concepts in the HBM. "Health motivation refers to a generalized state of intent that results in behaviors to maintain or

improve health" (Champion, 1984, p. 74). The health motivation component of the HBM has been used in predicting health-related behavior.

In 1988, Rosenstock, Becker, and Stretcher proposed incorporating the concept of self-efficacy into the HBM. Efficacy expectations reflect the individual's confidence in his or her ability to perform a recommended action (Bandura, 1977).

The HBM is founded on the assumption "that the subjective world of the perceiver determines behavior rather than the objective environment, except as the objective environment comes to be represented in the mind of the behaving individual" (Mikhail, 1981, p. 67). People's behavior is a result of what they believe to exist. This may not coincide with professional viewpoints. Further, the HBM is primarily concerned with the current subjective state of the individual rather than with past experiences or history (Mikhail, 1981).

The HBM hypothesizes that health-related behavior depends primarily upon two variables: "(1) the desire to avoid illness (or if ill, to get well); and (2) the belief that a specific health action will prevent (or ameliorate) illness" (Janz & Becker, 1984, p. 2). There are five attitudinal concepts relating to health behavior: the individual's perceived susceptibility to the health threat, perceived severity of the health threat, perceived benefits of preventive action, perceived barriers (costs) of preventive action (Champion, 1984), and general health motivation.

The HBM constructs of perceived susceptibility, severity, benefits, barriers and modifying factors are defined here. Perceived susceptibility is defined as "Individuals' estimated probability that they will encounter a specific health problem constitutes perceived susceptibility" (Pender, 1987, p. 44). Personal susceptibility is on a

continuum, ranging from high to low in terms of degree of perceived risk for developing a specific illness. In the presence of medically-established illness, this dimension has been reformulated to include such questions as estimates of perceived resusceptibility, belief in the diagnosis or susceptibility to illness in general (Janz & Becker, 1984).

Perceived severity is defined as perceived seriousness or severity of a given health problem can be judged either by the degree of emotional arousal created by the thought of the disease or by the difficulties that individuals believe a given health condition would create for them (Pender, 1987, p. 47). Implications regarding possible social consequences, work, family life, social relationships, and commitments fall into this category as well as medical consequences. Medical consequences such as reduced physical or mental functioning are part of perceived severity.

The constructs of the HBM support a theory which views the threat of a disease as the key factor that influences the behavioral choices of an individual. Perceived susceptibility and perceived severity are both individual perceptions. The individual's perceived susceptibility to a disease, plus the individual's perceived severity of the disease combine to form the individual's perceived threat of disease. The degree of intensity created by perceived susceptibility and severity is directly proportional to the degree of intensity created by the now perceived threat of disease. Also, perceived susceptibility and severity have a strong cognitive component and are partially dependent upon the individual's knowledge (Rosenstock, 1974).

Perceived benefits is "Beliefs about the effectiveness of recommended preventive actions appear to be important determinants of health-protecting behavior" (Pender,

1987, p. 47). Perceived benefits are forces which may lead to health-related behavior. "A 'sufficiently threatened' individual would not be expected to accept the recommended health action unless it was perceived as feasible and efficacious" (Janz & Becker, 1984, p. 2).

Perceived barriers are "The potential negative aspects of a particular health action may act as impediments to undertaking the recommended behavior" (Janz & Becker, 1984, p. 2). The individual will consider what will this health behavior "cost" me? "Cost" may be interpreted as monetary, life change requirements, inconvenience or other unpleasant variables.

Becker and Maiman (1975) stated that perceived benefits minus the perceived barriers determines the likelihood of the individual taking the recommended health action:

> Even an individual who is at a high level of 'readiness' (i.e., perceives substantial possibility of contracting disease, with resulting serious consequences), likelihood of adherence will still be a function of beliefs about the probable effectiveness of the recommended action in reducing the health threat, and about the difficulties (financial, physical, and psychological) which must be encountered or endured if such action is taken. (p.16)

Modifying factors are factors which affect an individuals' predisposition to take preventive or curative action. Demographic factors such as sex, age, income, and education are modifying factors. Socio-psychological variables such as reference groups, type of family unit, individual role expectations and expectations of significant others will influence individual expectations. Structural variables may also influence

health-related behavior. Two such variables are knowledge about the disease and prior contact with the disease (Pender, 1987).

Cues to action or triggers which stimulate health-related behavior are another variable within the model. A cue to action must occur to cause behavior. The cues may be internal (symptoms) or external (e.g., postcard reminder) or a combination of both. It is proposed that the perceived level of intensity of severity and susceptibility is inversely proportional to the intensity required to produce health-related behavior. However, in some instances where perception of susceptibility and severity is enormous, certain individuals may be rendered incapable of action. Unfortunately, precise answers regarding cue motivation are not known since empirical usage of the HBM has not yet adequately measured the role of cues (Rosenstock, 1974).

Motivation is defined as behaviors that seek to maintain or improve health are health motivation behaviors. They are directed towards attaining or maintaining a positive state of health or to avoid illness. The individual must have ample health concern or motivation to make health issues quantifiable. It is believed that the concept of health motivation used in combination with the original four HBM concepts may have significant predictive ability (Champion, 1984).

Rosenstock, Stretcher and Becker (1988) included self-efficacy as a construct of the HBM in explaining health behaviors. Efficacy expectations are defined as "beliefs about how capable one is of performing a specific behavior in particular situations that lead to the outcome in question" (Kelly, Zyzanski, & Almagno, 1991, p. 312).

In summary, the theoretical constructs of the HBM are offered by its authors as a basis for predicting and explaining health behaviors, compliance to prescribed

therapeutic regimens and responses to symptoms. The concept of self-efficacy provides a theoretical base for evaluating an individual's perception of situation specific personal capabilities. The original health belief model does not provide for efficacy evaluation within its constructs. Rosenstock, Stretcher & Becker (1988) proposed incorporating self-efficacy into the HBM. Thus, measurement of perceived susceptibility, severity, benefits, barriers and motivations as well as situation specific efficacy perception has implication with regard to evaluating and identifying specific areas for intervention that will help produce lifestyle and behavior changes in patients with chronic illness.

The HBM focuses on individual perceptions of disease, therefore, the HBM concepts may be used to explain and predict the health related behavior of CAD patients with respect to the exercise component of cardiac rehabilitation. To date, the use of the HBM in attempting to explain and predict individual cardiac health related behaviors has produced significant yet inconsistent results. (Janz & Becker, 1984). The concepts of barriers, benefits and self-efficacy have produced the most consistently significant relationships. This study will focus on the development of a research tool which measures the concepts of benefits and barriers related to cardiac exercise behavior. For purposes of this study, tool development will not include the concepts of susceptibility, severity, health motivation, or self-efficacy with the cardiac population.

Review of Literature

The HBM has been used repeatedly to attempt to explain compliance behaviors in multiple populations. The existing research has yielded inconsistent results. The

existing research does support that "perceived barriers" is probably the most powerful HBM construct, followed in descending order by "benefits", "susceptibility" and "severity". Melnyk (1988) notes there is considerable confusion regarding the barrier variable due to lack of adequate definition and operationalization of the concept. Research focusing on the cardiac population and barriers has yielded inconsistent results, further supporting the need for HBM tool development in the cardiac population..

Andreoli (1981) examined self concept and the concepts of perceived resusceptibility, benefits and severity when studying 71 hypertensive males. The patients were categorized as compliant or non compliant based on a record of their diastolic blood pressure levels and a nursing interpretation of their status of compliance with prescribed diet and medication regimen over a one year time period. Both compliant and non compliant subjects completed two instruments, the Tennessee Self Concept Scale (TSCS) and the Health Beliefs Questionnaire (HBQ). The HBQ, developed by Andreoli, measured beliefs about susceptibility to hypertension, severity of hypertension and benefits of adhering to prescribed therapy for hypertension. Beliefs about barriers to adherence to hypertension therapy were not measured. No significant difference was found between compliant and noncompliant subjects with respect to all concepts studied.

Cronin (1986) replicated Andreoli's (1981) study of hypertensive subjects. She administered the HBQ in an interview format to study the concepts of resusceptibility, severity, and benefits in 38 subjects, 20 compliant and 18 noncompliant. Compliance status was determined by evaluation of each subject's therapeutic outcomes: diastolic

blood pressure and self report of compliance to recommended antihypertensive drug therapy . Subjects were recruited from a family practice clinic in an ambulatory care facility affiliated with a university school of medicine.

Cronin's (1986) findings were that hypertensive clients who were compliant to prescribed therapy do not have significantly different health beliefs about resusceptibility to hypertension, severity of hypertension, or benefits to following recommended therapy than do those who are noncompliant. She noted, however, that analysis of the data obtained from the HBQ indicated very high mean scores for each item and a low standard deviation. It was her opinion the instrument did not discriminate well between the individuals in her study. Neither Cronin nor Andreoli (1981) studied the relationship of barriers to appropriate health behaviors in the cardiac population.

DeVon and Powers (1984) examined thirty hypertensive patients, 15 controlled and 15 uncontrolled, with respect to compliance to recommended medication therapy, health beliefs and modifying variables. Determination of compliant or noncompliant behavior was judged by the subjects private medical doctor. The subjects completed the 1976, HBM based Standardized Compliance Questionnaire (SCQ), developed by Sackett, Becker, MacPherson, Luterback, and Haynes. The SCQ is a 35 item questionnaire meant to assess patient perception with respect to general health motivation, severity of illness, susceptibility/resusceptibility, efficacy of treatment, and barriers as well as cues to action. The psychometric properties of the SCQ are not well documented.

DeVon and Powers (1984) found no significant difference in the perceived

health beliefs of barriers, benefits and susceptibility between the compliant hypertensive subjects and the noncompliant hypertensive subjects whom they studied. The authors concluded the relationship between health beliefs and compliance may be more complex than originally thought. DeVon and Powers suggested the HBM based SCQ may not be useful for predicting compliance potential to prescribed therapy in chronic illness. It may be useful, however, in describing indicators of health beliefs affecting compliance after treatment is begun.

Plawecki and Mallory (1988) studied health beliefs and compliance behavior in 28 Black female hypertensive subjects. Subjects completed a thirty-six item questionnaire which tested the HBM variables of susceptibility to illness, severity of disease with respect to hypertension, and benefits of recommended therapy. Data were analyzed to determine the relationship between compliance and non compliance to recommended therapies and the subject's health beliefs.

Results of the survey by Plawecki and Mallory (1988) indicated that compliant subjects had more positive health related beliefs with respect to severity, susceptibility, and benefits than did noncompliant subjects. The researchers reported that results from both analysis of variance and chi square test indicated a statistical significance. However, statistics reported in the article were ambiguous. Information regarding the research instrument was incomplete. No reliability or validity information on the tool was stated.

The relationship of health beliefs and knowledge to exercise compliance of patients who had undergone coronary artery bypass surgery was studied by Tirrell and Hart (1980). The subjects were twenty-six men and four women. Subjects were

interviewed in their homes ten to twelve months after coronary bypass surgery regarding their level of knowledge about the "heart walk" regimen, a prescribed, nonstressful, individualized exercise program. They were interviewed to determine their level of adherence with the "heart walk" regimen, their knowledge using the pulse rate as an activity monitor, their perceptions of severity of personal condition and susceptibility, barriers to treatment, their general health motivation and demographic data. The SCQ (Sackett et al., 1976) was modified and used to assess the subjects health beliefs of severity, susceptibility, and barriers. Tirrell and Hart did not research benefits to adherence to a recommended exercise regimen.

Tirrell and Hart (1980) also examined the relationships between Health Belief Model variables of severity, susceptibility, and barriers, and compliance. The strongest relationship was seen between perception of barriers and participation in the recommended "heart walk" program. The greater the number of perceived barriers, the lower the level of exercise compliance reported. Subject knowledge of the exercise regimen also showed a strong relationship to compliance to the "heart walk" regimen. The better the understanding of the exercise regime, the greater the compliance.

Hijeck (1984) developed but did not test the Health Beliefs Questionnaire for predicting entrance into a cardiac rehabilitation program. Hijeck included items to measure perceived susceptibility to cardiac disease, perceived severity to cardiac disease, and perceived benefits of and barriers to preventive care. The tool contained fourteen questions with responses graded on a seven point Likert scale. Content validity was determined by critique from four experts in clinical cardiac care. Hijeck did not determine the predictive ability of his tool. Hijeck intended his tool to be used

by the cardiac rehabilitation nurse to identify health beliefs as defined by HBM constructs and use this knowledge to individualize interventions to optimize patient compliance results.

Hiatt, Zimmerman, and Hoenshall-Nelson (1990) modified Hijeck's instrument and developed the Patient Entrance into Cardiac Rehabilitation Program Questionnaire (PECRPQ). The PECRPQ measures the patient's perceptions about susceptibility to reinfarction, severity of heart attack in relation to impact on lifestyle and other diseases, and benefits of and barriers to participation in cardiac rehabilitation. Hiatt et al. (1990) intended to use the PECRPQ to predict which cardiac patients would enter a cardiac rehabilitation program.

Thirty nine subjects with a diagnosis of acute myocardial infarction, angina, or recent coronary artery bypass surgery were studied to identify factors that influence participation in a cardiac rehabilitation program. No significant differences were found between groups who entered a cardiac rehabilitation program and those who did not with respect to the concepts of perceived susceptibility and perceived severity. Significant relationships were found between demographic variables of income and marital status and perceptions of benefits from or barriers to participation in a prescribed cardiac rehabilitation program. The subjects behavior of entrance into a cardiac rehabilitation program could be partially explained by Rosenstock's HBM construct cues to action. Patients with larger incomes are more likely to have health insurance and other financial resources. Their rate of entrance into the cardiac rehabilitation program was greater than the subjects with lower incomes. Cronbach alpha for perceived benefits of or barriers to the behavior of entrance into a cardiac

rehabilitation program was .79. Cronbach alpha for susceptibility was only .02 and perceived severity was .13.

Muench (1987) also studied the relationship of perceived susceptibility, perceived severity and perceived benefits from and barriers to the compliance behaviors of patients with coronary heart disease enrolled in a cardiac exercise program. Seventy two subjects were studied. Muench reported a positive relationship between support from a close relative and higher perceived benefits from participation in a cardiac rehabilitation program. Perceived decreased barriers to participation in a cardiac rehabilitation exercise program were also reported among subjects who were already enrolled in a cardiac rehabilitation program.

A psychometrically sound instrument which can be used to measure the cardiac patient's perceptions of benefits from or barriers to recommended therapy has not been discovered through literature review. Many of the existing cardiac focused HBM based instruments fail to measure either barriers or benefits and are statistically unreliable. This further supports the need for development of a reliable, valid HBM based instrument for use with cardiac patients. Valid HBM instruments have been developed for other patient populations.

Champion (1984) developed the Self Breast Examination (SBE) questionnaire using the constructs of the HBM. The SBE has five subscales representing beliefs for each of the HBM constructs of benefits, barriers, susceptibility, severity, and health motivation. Items were developed based on HBM instruments used in past research. All items were measured on a five point Likert scale. Strongly agree was scored as five and strongly disagree as one. Champion distributed 640 questionnaires by mail,

301 (47%) were returned. Construct validity was evaluated by factor analysis and when appropriate, multiple regression analysis was used. Cronbach's alpha for the five constructs were susceptibility .77, seriousness .78, health motivation .60, benefits .61, and barriers .76.

Kim, Horan, Gendler and Patel (1991) developed the Osteoporosis Health Belief Scale (OHBS) to measure health beliefs related to osteoporosis. Fifty items were initially generated, using the SBE (Champion, 1984) as a basis. A five point Likert scale was used to rate items from strongly agree (5) to strongly disagree (1). Fifteen items were deleted from the original fifty items for the final instrument. These items were submitted to factor analysis to evaluate construct validity. The OHBS differs from the SBE in that the SBE deals with a single behavior: breast self examination; while the OHBS focuses on two risk reduction behaviors: calcium intake and physical exercise.

Kim, Horan and Gendler (1992) revised and re-evaluated the OHBS with 201 female subjects. Cronbach alphas for the revised calcium subscales ranged from .71 to .82. Cronbach alphas for the revised exercise subscales ranged from .71 to .82. Both of these instruments can be considered valid and reliable guides for tool development with other populations. The CEHBS was developed based on the Champion (1984) and Kim et al. (1992) instruments.

In order to modify behavior it is necessary to identify the variables that influence the behavior. Despite the large body of knowledge related to cardiac exercise adherence behavior and the HBM, more investigation of HBM concepts and their relationships to adherence behavior is needed to further substantiate or refute existing

findings. To date, the studies using the HBM constructs to look at exercise behavior indicate a need for further development of a measurement tool especially with the constructs of barriers and benefits. Literature review shows there is considerable confusion and inconsistent findings concerning the relationship of these constructs and behaviors at the empirical level. Current instruments which focus on the cardiac population do not provide the ability to consistently measure and discriminate the behavioral relationships desired. A need for more discriminating instruments is also needed to promote consistency in testing.

Implications for Study

CAD represents a health problem of significant magnitude. CAD patients need lifestyle changes in order to maintain an optimal state of health. In order to modify behavior, it is necessary to identify the variables that influence behavior. There is a need for greater understanding of the processes which facilitate or inhibit individual lifestyle changes. Theoretically, a determination of perceptual factors which contribute to adherence/non-adherence behavior can provide a basis for appropriate and meaningful intervention in supporting lifestyle change for the individual with CAD. The constructs of the HBM offer support to the use of an educational intervention approach that stresses the benefits of a given behavior while also emphasizing the consequences of continuing a harmful behavior. The inconsistency found in the current research utilizing the HBM supports the need for additional tool development and research of the HBM constructs. In order to modify behavior it is necessary to identify the variables that influence behavior.

Definition of Terms

This study is limited to the development of an instrument that measures two of the HBM constructs, benefits and barriers. To evaluate validity of the CEHBS, the relationship between the perceptions of benefits and barriers of CAD patients to their adherence to a recommended cardiac exercise regimen will be examined.

Benefits Benefits are cardiac patient's beliefs about certain activities or behaviors which, if consistently adhered to, may lead to control of or reduced risk of another cardiac event.

Barriers Barriers are the negative aspects or "cost" of specific activities or behaviors which may prevent the cardiac patient from adhering to recommended treatment. A barrier might be the cost of a cardiac rehabilitation exercise program, the inconvenience of attending this program, or lack of support from significant others to participate in a prescribed exercise regimen.

Cardiac Exercise Regimen Compliance Cardiac exercise regimen compliance is defined as participation in cardiovascular exercise three to four times a week.

Cardiovascular Exercise According to the two participating hospital cardiac rehabilitation programs cardiovascular exercise is exercise that keeps the heart rate raised to a pre-determined target heart rate for twenty to thirty minutes and is performed three to four times a week.

CHAPTER III

METHODOLOGY

Study Design

The primary purpose of this study was to develop and evaluate the CEHBS. In addition to evaluation of reliability of the CEHBS, criterion related validity of the CEHBS was assessed by examining relationships between barriers, benefits and adherence to a recommended cardiac exercise program. A cross-sectional, descriptive study design was used to examine the relationship between the HBM variables of perceived benefits and barriers and an individual's adherence to a recommended cardiac rehabilitation exercise program. Data on subjects' perceptions of benefits and barriers were obtained from subjects following hospitalization for one of the following coronary artery diseases: acute myocardial infarction, angina pectoris, or post coronary artery bypass graft.

The researcher recognizes there may be other variables which may influence compliance to an exercise program. The presence of another chronic disease that may inhibit exercise or complications as a result of the cardiac event are examples of two such variables.

This study design was chosen for its convenience and efficiency. The design allows for reasonably easy access to appropriate patient populations with minimal research expense. Disadvantages of this design would include difficulty in interpreting

correlational findings due to the interrelationship among variables and alternative explanations for the findings.

Sample and Setting

Subjects were recruited from a 350 bed, acute care medical center in northwestern Michigan, and a 203 bed community hospital in southwestern Michigan. Data were collected from a convenience sample of subjects with recent hospitalization and diagnosis of acute myocardial infarction, angina pectoris, or had coronary artery bypass graft surgery or angioplasty. All subjects received standard Phase I in-hospital cardiac rehabilitation instruction and consented to participate in the study. Both programs from which subjects were recruited have been evaluated and are consistent in Phase I content. One hundred forty three subjects were recruited. Ninety (63.3%) returned completed questionnaires.

Subjects met the following criteria:

1. Age 21 or older,
2. Have documented CAD and a diagnosis of myocardial infarction, angina pectoris, or undergone coronary artery bypass graft surgery or angioplasty.
3. Literate in the English language.
4. Received in-hospital Phase I cardiac rehabilitation instruction.
5. Gave consent to participate in the study.

Instruments

Instruments used to measure subjects responses were the Cardiac Exercise Health Belief Scale, the Exercise Compliance Questionnaire and a demographic questionnaire.

Cardiac Exercise Health Belief Scale

The Cardiac Exercise Health Belief Scale was developed by the researcher to measure subjects' health beliefs with relation to adherence to a regular cardiac exercise program (See Appendix A). The CEHBS was adapted from the Self Breast Examination instrument (Champion, 1984) and the Osteoporosis Health Belief Scale (Kim et al., 1991; Kim et al., 1992). The CEHBS differs from the SBE and the OHBS in that it measures only the HBM constructs of barriers and benefits. That is, items are reflective of the HBM concepts of perceived benefits of and barriers to a recommended cardiac exercise therapy. Whenever possible the language of the items was preserved as it appeared in the SBE and OHBS. A five point Likert scale was used to rate items from strongly agree (5) to strongly disagree (1). The results from psychometric analysis of the CEHBS are discussed in Chapter Four.

Exercise Compliance Questionnaire

The Exercise Compliance Questionnaire (ECQ) was developed by Karen Radtke (1989) to determine how well patients complied with their prescribed home exercise programs. Radtke (1989) reported that the content of the ECQ was reviewed for face validity by physical therapists who prescribe home exercise.

The following revisions were made in the ECQ for utilization in this study. Item four was made the energy expenditure equivalent of item three. The score for compliance/noncompliance scoring was based on items one through four only. The

respondents must have responded with a two or higher on items one and two and achieve a total score of five to be considered compliant. Items five through eight were not used to determine compliance. (See Appendix B).

Demographic Data Questionnaire

This questionnaire assesses demographic and socioeconomic information. Variables which are of interest include age, sex, educational level, ethnic background, income, and physical limitations of subjects (See Appendix C).

Procedure for Data Collection

This study included subjects who experienced a cardiac event and received inpatient Phase One cardiac rehabilitation. The researcher utilized the cardiac rehabilitation nurses on the hospital cardiac unit to assist in the identification of possible subjects who met the established sample selection criteria. The researcher approached the subject for participation. Purpose of the study was explained and written consent obtained (See Appendix D). At six to eight weeks following discharge, an envelope containing patient instructions, the questionnaires, and an addressed, stamped return envelope were mailed to the subject. The six to eight week delay was to allow for appropriate healing and time to begin the recovery exercise program recommended during inpatient Phase One cardiac rehabilitation. The initial mailing was followed by a postcard reminder two weeks later to subjects who had not responded.

Human Subject Consideration

There was no risk to the subjects in this study. In fact, for some subjects, the research questionnaires may have actually reminded them of recommended exercise

behaviors. Approval was obtained from Grand Valley State University Human Subjects Review Committee and Human Subjects Review Committees of both hospitals.

CHAPTER IV

RESULTS

Data Analysis Preparation

Data were collected over eight months from a West Michigan Community Hospital and a Northern Michigan Medical Center. In preparation for computer analysis, data were entered into a coding sheet as appeared on the data collection record. Data analysis for this study was performed using SPSS/PC+. Descriptive statistics were computed to describe the research sample. Cronbach alpha was computed to determine the reliability of the CEHBS. Factor analysis and discriminant function analysis were performed to examine the validity of the CEHBS.

Characteristics of Subjects

There was a total of ninety subjects who participated in the study. Sixty nine were males and 21 were females. The subjects ranged in age from 39 to 85 with a mean age of 61.3 years. Seventy subjects (77.8%) were married. Eighty five (94.4%) were Caucasian, three (3.3%) were Native American, one (1.1%) was Black and one (1.1%) was Hispanic. Forty nine subjects (54.0%) were not employed, forty subjects (44.9%) were employed. One subject did not respond to this question. Forty one subjects responded to employment status of full-time or part time. Of those forty one subjects, thirty-seven (90.0%) were employed full-time, four (10.0%) were employed part-time. Sixty four subjects (76.1%) were employed in semi-professional or

professional occupations. Seventy subjects (78.0%) reported incomes of $20,000 or more per year. Eighty seven subjects (96.7%) reported having some type of health insurance, however, thirty-three subjects (36.7%) were unsure of what their insurance benefits were. Characteristics of the sample are reported in Table 1.

Subjects were also surveyed for five modifiable cardiac risk factors of smoking, excessive use of table salt, high fat diet, overweight, and stress. Table 2 reports the number of risks reported by the subjects. Overweight and stress were the most frequently reported risk factors.

Four subjects (4.4%) reported a physical limitation which prevented them from participating in the recommended cardiac rehabilitation program. Reasons stated were: arthritis of knees, bad legs, walk with cane, and lung problems.

Evaluation of the CEHBS

Content validity, construct validity, and criterion related validity of the instrument were evaluated. Cronbach alpha was used to compute the reliability of the CEHBS. Discussion of the validity of the instrument will be presented first, followed by discussion of the instrument reliability.

Table 1

Characteristics of Sample (N = 90)

Characteristics		n	%
Age (in years)		Mean = 61.3	
Gender:	Male	69	76.9
	Female	21	23.3
Marital Status:	Married	70	77.8
	Not married	20	22.2
Education:	8th grade or less	5	5.5
	High School	35	38.9
	College (one to four years)	36	40.0
	Graduate School	14	15.6
Employment Status:	Not employed	49	54.0
	Employed	40	45.0
	No response	1	1.0

Table 1 (continued)

Characteristics of Sample (N = 90)

Characteristics		n	%
Occupation:	Unskilled/factory	20	22.0
	Semi-professional/clerical	27	30.0
	Professional	37	41.0
	No response	6	7.0
Income: in dollars	0 - 20,000	19	21.0
	20,001 - 40,000	38	42.0
	40,001 - higher	32	36.0
	No response	1	1.0
Health Insurance:	Yes	87	96.7
	No	3	3.3
Health Insurance for Cardiac Rehabilitation:	No coverage	6	7.0
	80% coverage	28	31.1
	90% - 100% coverage	23	26.0
	Unsure of benefits	33	37.0

Table 2

Number of Risk Factors Reported by Subjects (N = 90)

Number of Factors	n	%
None	19	21.1
One	33	33.3
Two	21	23.3
Three	15	16.7
Four	4	4.4
Five	1	1.1

Validity of the CEHBS

Content Validity

Content validity was established through literature review and input from nursing faculty, experts in HBM theory, and nurses in clinical practice in cardiac rehabilitation. Twenty-six items were developed. A pretest was conducted with fifteen patients, men and women, who were enrolled in a cardiac rehabilitation program. Based on content validity evaluation and the pretest results, the questionnaire was reduced from 26 to 21 items and a few words were changed to clarify meaning. To assure that the subjects understood the concepts as they were intended to be used, the questionnaire was introduced with a brief explanation of coronary artery disease and cardiovascular

exercise. The instrument was also reviewed by several educators to ensure the reading and comprehension level did not exceed eighth grade ability.

Construct Validity

The twenty one items of the CEHBS was subjected to factor analysis to determine the construct validity of the instrument. A principal component factor technique with iteration was used. The orthogonal rotation of the extracted factors was done by the Varimax procedure. For the factor analysis for this questionnaire Kaiser's criterion of eigen values greater than or equal to one was used in deliminating the numbers of factors in the solution. A factor loading of .35 was used. Factor analysis was done to examine whether the CEHBS indeed had two factors representing two constructs of the Health Belief Model.

Factor analysis initially revealed a five factor solution. All benefit items loaded under factor one. Barrier items loaded under factors two, three, four, and five. Barrier item 21, "my family and friends think I am foolish to exercise regularly since I had my heart problem", loaded under all factors with values less than .35. Thus, item 21 was deleted. A two factor solution was computed on the remaining twenty items using a rotated factor matrix. The final instrument had ten benefit and ten barrier items. Factor loadings ranged from .45 to .80. See Tables 3 and 4. The benefit and barrier subscale items all loaded on factors related to a single theoretical dimension, indicating the benefits and barriers subscales are mutually exclusive.

Table 3

Factor Loading of Items on CEHBS Benefit Subscale (N = 89)

	Factor Loading
I feel exercising regularly is vital for my health.	.80
Exercising regularly reduces my risk of future heart problems by helping me control stress.	.80
I feel better when I exercise regularly.	.78
Exercising regularly reduces my risk of another heart problem.	.76
When I exercise regularly I feel good about myself.	.75
I can slow the progression of my heart disease by exercising regularly.	.74
I feel exercising regularly will strengthen my heart muscle.	.74
Exercising regularly reduces my risk of future heart problems by helping me lose weight.	.70
Exercising regularly helps to keep my arteries open.	.57
My family feels my exercise program is important in reducing my risk of future heart problems.	.56

Note: N = 89 due to missing response from one subject.

Table 4

Factor Loading of Items on CEHBS Barrier Subscale (N = 90)

	Factor Loading
I am too busy to exercise regularly.	.78
Exercising regularly interferes with other activities I need to do.	.72
I dislike exercising regularly.	.70
Exercising regularly requires a new habit which is difficult.	.67
I don't have anyone to exercise regularly with me.	.61
Exercising regularly can be time consuming.	.57
I am afraid I will have symptoms such as chest pain or shortness of breath if I exercise regularly.	.52
I dislike exercising regularly because it makes me sweat.	.49
There is no place for me to exercise regularly.	.49
I am not strong enough to exercise regularly.	.45

Criterion Related Validity

Discriminant function analysis was performed to determine the predictive ability of the CEHBS with respect to compliant or noncompliant behavior. The discriminant function analysis revealed that 70.0% of the subjects were correctly classified by CEHBS benefits and barriers subscales into compliant and noncompliant groups. Of the 30 noncompliant subjects, twenty-two (73.3%) were accurately classified and 41 of

the sixty (68.3%) compliant subjects were correctly identified by the benefits and barriers variables. (Table 5).

Table 5

Discriminant Classification of Health Belief Model Variables by Compliance or Non-compliance to Cardiac Exercise (N = 90)

Actual Group	No of Cases	Predicted Group Membership	
		Non compliant	Compliant
Non compliant	30	22 73.3%	8 26.7%
Compliant	60	19 31.7%	41 68.3%

Percentage of "grouped" cases correctly classified: 70.0%.

Reliability of the CEHBS

The CEHBS was subjected to evaluation of internal consistency. The Cronbach alpha for the ten item benefit subscale was .90. The Cronbach alpha for the ten item barrier subscale was .84. Cronbach alpha for the Benefits and Barriers subscales are shown in Table 6. Table 7 and Table 8 report the Item Total Score correlation of the CEHBS Benefits and Barriers subscales.

Table 6

Cronbach Alpha for the CEHBS (N = 90)

Subscale	No. of Items	Cronbach Alpha
Benefits	10	.90
Barriers	10	.84

Table 7

Item-Total Score Correlation for the CEHBS Benefit Subscale (N = 89)

	Item-Total Correlation
I feel exercising regularly is vital for my health.	.77
Exercising regularly reduces my risk of future heart problems by helping me lose weight.	.76
I feel better when I exercise regularly.	.72
When I exercise regularly I feel good about myself.	.71
Exercising regularly reduces my risk of future heart problems by helping me lose weight.	.68
I feel exercising regularly will strengthen my heart muscle.	.67
Exercising regularly reduces my risk of another heart problem.	.67
I can slow the progression of my heart disease by exercising regularly.	.64
Exercising regularly helps to keep my arteries open.	.55
My family feels my exercise program is important in reducing my risk of future heart problems.	.53

Note: N = 89 due to missing response from one subject.

Table 8

Item-Total Score Correlation for the CEHBS Barrier Subscale (N = 90)

	Item-Total Correlation
I am too busy to exercise regularly.	.64
I dislike exercising regularly.	.60
Exercising regularly requires starting a new habit which is difficult.	.59
I am afraid I will have symptoms such as chest pain or shortness of breath if I exercise regularly.	.57
Exercising regularly interferes with other activities I need to do.	.55
There is no place for me to exercise regularly.	.54
I dislike exercising regularly because it makes me sweat.	.51
I am not strong enough to exercise regularly.	.50
Exercising regularly can be time consuming.	.46
I don't have anyone to exercise regularly with me.	.41

CHAPTER V

DISCUSSION AND IMPLICATIONS

Discussion

The purpose of this study was to develop and evaluate the CEHBS. The instrument described here consists of two subscales: CEHBS Benefits and Barriers. The results of this research provide support for the reliability and validity of the CEHBS Benefits and Barriers subscales. The measures of reliability compared favorably with both the instruments of Champion (1984) and Kim et al. (1992). Table 9 reports those comparison values.

Table 9

Comparison of HBM Instrument Cronbach Alpha

	Benefits	Barriers
Champion (1984)	.61	.76
Kim et al. Calcium (1992)	.80	.74
Kim et al. Exercise (1992)	.81	.82
McGinn (current study)	.90	.84

Factor analysis of the CEHBS demonstrated similarities to those of the Champion instrument (1984) and the Kim et al. (1992) instrument with reference to the benefits and barriers subscales. Both Champion (1984) and Kim et al. (1992) found their subscales to be mutually exclusive as was found with the CEHBS. Further psychometric analysis of the CEHBS demonstrated similarities to the Kim et al. (1992) instrument with respect to discriminant function analysis. Kim et al. (1992) found that Barriers and Health Motivation were important constructs in explaining both calcium intake and exercise behaviors. The Kim et al. instrument (1992) correctly classified 72% of 201 female subjects aged 35 years and older by the barriers calcium subscale and 65.7% of these subjects by the barrier exercise subscale. A 1987 study by Champion examining frequency of breast self exam reported that 54% of the subjects were correctly classified into the three groups by barriers, knowledge and susceptibility.

Limitations

The sample size is a concern when performing factor analysis. Gorsuch (1983) suggested a sample size of a minimum ratio of five subjects per item, but not less than 100 subjects for any factor analysis. This study had a ratio of 4.3 subjects per item with a total sample size of 90. Despite the sample size limitation, the results of the psychometric analysis of the CEHBS provided convincing support for the instrument and its continued development.

The sample for this study was too homogeneous. The subjects were primarily middle class Caucasian males, limiting generalization of results to larger, more

diversified populations. The author encourages future studies to begin using this instrument with female and more culturally diverse populations.

Assessment of subject exercise behavior was based on self report. Accuracy of information gained through self report has potential to be unreliable. Subjects may find it difficult to honestly report noncompliance to prescribed or recommended behaviors. Despite assurances of confidentiality, subjects may also fear noncompliant behaviors will be discovered and the subject will then risk potential confrontation.

Implications for Nursing Practice

Health care professionals are in need of specific research based knowledge that can guide clinical practice. This research, as well as that of Champion (1984) and Kim et al. (1991; 1992), support the HBM as being theoretically sound. This current study supports the use of HBM constructs of benefits and barriers for development of nursing interventions. For example, a measure of an individual's concept of benefits derived from regular cardiovascular exercise could be evaluated in terms of available resources (benefits or barriers) and interventions could be developed to help persons understand personal benefits for this health related behavior. Barriers to action could be evaluated in terms of available resources, allowing interventions to be planned which will reduce or remove barriers to action thereby enhancing the probability of patient compliance behavior as well as reducing waste in utilization of costly health care resources.

The results of this study suggest that measurement of the health beliefs of cardiovascular patients with respect to benefits and barriers to certain health promoting behaviors provides important predictive information. This predictive information may

be used to direct the use of health care resources in order to obtain optimum results for the least cost.

Recommendations

Before interventions are planned based on the results of this study, much additional study is recommended. Studies need to be undertaken which further define the relationships of the health beliefs of the noncompliant and the compliant cardiovascular patients and how measuring these beliefs may be used to predict behaviors and guide health care interventions. There have been only a limited number of studies which examine health beliefs of the cardiovascular patient and exercise. These relationships need to be more thoroughly examined along with the concept of self-efficacy. Bandura (1977) defined self-efficacy expectation as the belief that one is capable of successfully accomplishing a particular behavior. Rosenstock (1990) suggested that the addition of self-efficacy to the traditional HBM should improve explanation and prediction, particularly in the area of life-style practices. Gortner and Jenkins (1990) reported self-efficacy expectations were found to be a significant predictor of patient compliance with prescribed walking regimens at twelve weeks post cardiac surgery. This data supports the need for further development and testing of research instruments utilizing the constructs of HBM Barriers and Benefits with self-efficacy.

It is recommended the CEHBS be tested with larger, more heterogeneous populations. Measurement of patient beliefs must also be done at later intervals than this study, perhaps six or nine months post cardiac incident. Comparison of patient perceived benefits from and barriers to exercise at eight weeks and one year may yield

information that lends insight into factors which will produce long term versus short term compliance and behavior change.

Development of the CEHBS is in the initial stages. The results of the research yielded substantial evidence for the ability of the CEHBS Benefits and Barriers scales to reliably and validly measure the constructs. Further use and revision of the CEHBS is encouraged. Development and inclusion of self-efficacy as an additional motivational dimension should be considered.

APPENDICES

I.D. NO:_____

Appendix A

Cardiac Exercise Health Belief Scale

This is a questionnaire designed to determine the way in which different people view certain issues related to exercise and heart disease. The questionnaire includes belief statements with which you may agree or disagree. Read each statement carefully, then CIRCLE the letters to the left of the item which most closely represents your personal beliefs. This is a measure of your personal beliefs. There are no right or wrong answers.

The letters to the left of each statement stand for the following responses:

SD Strongly Disagree
D Disagree
N Neutral
A Agree
SA Strongly Agree

In this questionnaire:

HEART DISEASE includes any of the following: myocardial infarction (heart attack), angina (chest pain with exertion), and coronary artery bypass graft (CABG).

CARDIOVASCULAR EXERCISE is exercise that keeps your heart rate raised for twenty to thirty minutes and is performed three to four times a week.

EXERCISE when used in this questionnaire means cardiovascular exercise.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
SD	D	N	A	SA	1.	I feel exercising regularly will strengthen my heart muscle.
SD	D	N	A	SA	2.	Exercising regularly helps to keep my arteries open.
SD	D	N	A	SA	3.	I feel exercising regularly is vital for my health.
SD	D	N	A	SA	4.	Exercising regularly reduces my risk of another heart problem.
SD	D	N	A	SA	5.	I can slow the progression of my heart disease by exercising regularly.
SD	D	N	A	SA	6.	When I exercise regularly I feel good about myself.
SD	D	N	A	SA	7.	Exercising regularly reduces my risk of future heart problems by helping me control stress.
SD	D	N	A	SA	8.	Exercising regularly reduces my risk of future heart problems by helping me lose weight.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
SD	D	N	A	SA	9.	I feel better when I exercise regularly.
SD	D	N	A	SA	10.	My family feels my exercise program is important in reducing my risk of future heart problems.
SD	D	N	A	SA	11.	I am not strong enough to exercise regularly.
SD	D	N	A	SA	12.	Exercising regularly can be time consuming.
SD	D	N	A	SA	13.	Exercising regularly requires starting a new habit which is difficult.
SD	D	N	A	SA	14.	I dislike exercising regularly.
SD	D	N	A	SA	15.	There is no place for me to exercise regularly.
SD	D	N	A	SA	16.	I am too busy to exercise regularly.
SD	D	N	A	SA	17.	I dislike exercising regularly because it makes me sweat.
SD	D	N	A	SA	18.	I am afraid I will have symptoms such as chest pain or shortness of breath if I exercise regularly.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
SD	D	N	A	SA	19.	Exercising regularly interferes with other activities I need to do.
SD	D	N	A	SA	20.	I don't have anyone to exercise regularly with me.

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Appendix B

Exercise Compliance Questionnaire

The following eight questions relate to the prescribed home exercise program outlined by the physical therapist before you were discharged from the hospital. Please look over each question carefully and respond by placing a check mark by one of the five possible responses that **BEST** describes how you exercise. Please **CHECK ONLY ONE RESPONSE** to each question. If you have stopped exercising, please answer the question **FOR NON-EXERCISERS ONLY.** Thank-you.

1. How many times do you exercise (e.g., walk or bike) each week?

_____ 1. Fewer than 3 times a week
_____ 2. 3 times a week
_____ 3. 4 times a week
_____ 4. 5 times a week
_____ 5. More than 5 times a week

2. When you exercise, how long do you do it?

_____ 1. Less than 20 minutes
_____ 2. 20-25 minutes
_____ 3. 30-35 minutes
_____ 4. 40-45 minutes
_____ 5. More than 45 minutes

3. **FOR WALKERS ONLY** - When you walk, approximately how fast do you go in miles per hour (mph)?

_____ 1. Less than 2 mph
_____ 2. 2 mph
_____ 3. 3 mph
_____ 4. 4 mph
_____ 5. More than 4 mph

4. **FOR BIKERS ONLY** - When you bike, approximately how fast do you go in miles per hour (mph)?

_____ 1. Less than 5 mph
_____ 2. 5 mph
_____ 3. 6 mph
_____ 4. 8 mph
_____ 5. More than 8 mph

5. When you exercise, how often do you take your pulse before you warm up?

_____ 1. Never
_____ 2. Occasionally
_____ 3. Sometimes
_____ 4. Most of the time
_____ 5. Always

6. How often do you take your pulse after you cool down from exercise?

_____ 1. Never
_____ 2. Occasionally
_____ 3. Sometimes
_____ 4. Most of the time
_____ 5. Always

7. Did you exercise before your heart attack?

_____ 1. No
_____ 2. Yes, occasionally
_____ 3. Yes, 1 to 3 times a week
_____ 4. Yes, 3-4 times a week
_____ 5. Yes, more than 4 times a week

8. **FOR NON-EXERCISERS ONLY**

Date you stopped exercising:_____

Reason for stopping exercising:_____

Adapted from Radtke, K. L. (1989). Exercise compliance in cardiac rehabilitation. Rehabilitation Nursing, 14, 182-186.

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Appendix C

DEMOGRAPHIC QUESTIONNAIRE

The following personal information is needed for our data analysis. This information is completely confidential. For each question, choose only ONE answer unless otherwise indicated.

1. What is your present age in years? _____years

2. What is your sex?

( ) 1. male ( ) 2. female

3. What is your present marital status?

( ) 1. single
( ) 2. married
( ) 3. divorced
( ) 4. separated
( ) 5. widowed

4. Are you presently employed?

( ) 1. yes ( ) 2. no

( ) 3. full-time ( ) 4. part-time

What is (or was) your occupation? _____
(please specify)

5. What is your average household annual income?

( ) 1. less than $10,000
( ) 2. $10,001 - 20,000
( ) 3. $20,001 - 30,000
( ) 4. $30,001 - 40,000
( ) 5. $40,001 - 50,000
( ) 6. $50,001 - 60,000
( ) 7. Greater than $60,000

6. What is the highest grade or year of school you have completed?

(please circle)

none	00
Elementary	01 02 03 04 05 06 07 08
High school	09 10 11 12
College/technical school	13 14 15 16
Some graduate school	17
Graduate or professional degree	18

7. Please check ALL of the following that apply to you.

( ) 1. smoke
( ) 2. use a lot of table salt
( ) 3. eat a diet high in fat
( ) 4. overweight
( ) 5. under a lot of stress

8.. What race do you consider yourself to be?

( ) 1. Black
( ) 2. Caucasian
( ) 3. Asian
( ) 4. Hispanic
( ) 5. Native American
( ) 6. Other _____
(please specify)

9. Do you have health insurance?

( ) 1. yes
( ) 2. no

10. Does your health insurance cover all or any portion of a cardiac rehabilitation program?

( ) 1. yes
( ) 2. no

11. Do you have any physical limitations which prevent you from participating in CARDIOVASCULAR exercise. Cardiovascular exercise is exercise that keeps your heart rate raised for twenty to thirty minutes and is performed three to four times per week.

( ) 1. yes
( ) 2. no

If yes, please describe your physical limitations

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Appendix D

Information and Informed Consent
for
Research Project Participants

The purpose of the study in which you are being asked to participate is to examine the relationship of the health beliefs of individuals with heart disease and how they take care of themselves. The result of this study will help test the assessment tool that may be useful in early identification of problems related to an individual adopting a regular exercise program following the onset of angina, a heart attack, or heart surgery.

This research is being conducted by Ginger McGinn, RN, and Marianne Foster, RN, as course completion work of a master of science degree in nursing through Grand Valley State University. Any questions can be directed to Ms. McGinn at 394-3204 (days) or 396-7933 (evenings) or Ms. Foster at 935-6865 (days) or 943-3674 (evenings).

As a participant, I understand I will be asked to complete a survey in 6-8 weeks. I understand that the survey will take 10-15 minutes to complete. I will be provided with directions. It is not anticipated that participation will result in any physical, psychological, or economic risk. I understand I will receive no direct benefits as a result of participation.

I understand that every effort will be made to protect my confidentiality and any papers, reports, and articles will be made available to me on request to the researcher.

I have read and understand the information presented. I consent, of my free will, to participate in this study.

_____ _____

Participant Signature Witness Signature

_____

Date

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