

1993

# Health Value and Health Locus of Control: Impact Upon Compliance in Cardiac Patients

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HEALTH VALUE AND HEALTH LOCUS OF CONTROL:  
IMPACT UPON COMPLIANCE IN CARDIAC PATIENTS

By

Laura C. Wightman

A THESIS

Submitted to  
Grand Valley State University  
in partial fulfillment of the requirements  
for the degree of

MASTER OF SCIENCE IN NURSING

Kirkof School of Nursing

1993

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## ABSTRACT

### HEALTH VALUE AND HEALTH LOCUS OF CONTROL: IMPACT UPON COMPLIANCE IN CARDIAC PATIENTS

By

Laura C. Wightman

The purpose of this study was to examine the relationship of an individual's locus of control and health value to compliance to the prescribed rehabilitation regimen among post myocardial infarction and post cardiac surgery patients. Forty subjects were used in an ex post facto research design. The Multidimensional Locus of Control scale, the Value Survey, and a demographic data instrument were administered 1 to 2 days prior to discharge from the hospital. Thirty days after discharge the subjects completed the Health Behavior Scale.

It was hypothesized that male cardiac patients with an internal locus of control were more compliant to the cardiac rehabilitation regimen than patients with an external locus of control. In addition, it was hypothesized that male cardiac patients with a high value for health were more compliant to the regimen than patients with a low value for health. No statistically significant results were identified and thus these hypotheses were not supported.

*This is dedicated to all the nursing staff,  
who are truly making a difference in the  
care and education of cardiac rehabilitation  
patients and their families.*

## ACKNOWLEDGEMENTS

This thesis represents an end to a long and exhaustive effort of obtaining my Masters Degree in Nursing. Along the way key individuals have provided me with support, enthusiasm, guidance, inspiration, and encouragement. Without them I would not have been successful in this effort.

A sincere appreciation to the chairperson of my committee, Katherine Kim, PhD, R.N. Katherine has guided me with her expertise, supported me in times of frustration, and given me an enthusiasm for research. She serves as a mentor for me.

I am grateful to Mary Horan, PhD, R.N. for her mastery of the English language and her ability to critique my work, yet leave me intact as a novice researcher. I am appreciative of her time and assistance during Katherine's sabbatical. I also wish to thank Esther Javetz, PhD who gave me much guidance during the planning stages of this project.

A heartfelt thanks to Beth Freye, R.N., Linda Torrey, R.N., and Susie Rector, R.N. for their diligent efforts, time, and energy during the data collection process. Their commitment to quality patient care and the nursing profession is inspiring.

My appreciation is extended to Sigma Theta Tau Kappa Epsilon for their support in my research project by providing me with a grant for funding. Without their support the data coding process and other computer time would have been difficult.

Finally, my deepest appreciation goes out to my family. A special thanks to my grandmother and aunt who provided loving care to my children, served as editors, typists, and in many other roles to facilitate my professional growth. A loving appreciation to my daughters, Lisa and Ashley, who were both born during my efforts and spent a lot of time in libraries, at the computer, and at GVSU with me. I am truly grateful for the love and support my husband, Allen, has given to me during my graduate work. Allen's belief in me as a wife, mother, and professional kept me going during times of doubt and frustration.

Thank you, everyone.

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CHAPTER 1  
INTRODUCTION

Introduction

Compliance, for the purpose of this study, is behavior in which an individual initiates and actively carries out prescribed lifestyle changes over time. Therefore, noncompliance results in no initiation of lifestyle changes or initiation without actively carrying out the lifestyle changes over time. Estimates of noncompliance with medical regimens range from 30-60 percent (Cameron & Gregor, 1987). A high degree of noncompliance is a general problem encountered whenever and wherever health-related behavior change is attempted (Comoss, 1988). For individuals with a chronic illness, noncompliance rates generally tend to be higher. Over 50 percent of patients with hypertension fail to remain under medical care (Cameron & Gregor, 1987). Compliance with dietary advice averages 50 percent or less (Cameron & Gregor, 1987). Hussey and Gilliland (1989) estimated that approximately 50 percent of all patients with chronic illness fail to follow their physician's recommendations.

Compliance to a prescribed regime is a fundamental problem in cardiac rehabilitation programs. Recurrent lack of

success in risk factor modification efforts may play a primary role in explaining morbidity and mortality rates after a myocardial infarction (MI) (Derenowski, 1988). According to McMahon, Miller, Wikoff, Garrett, and Ringel (1986), nearly 80 percent of persons who experience an initial MI will survive, but recurrent MI is common. There is a reported fivefold difference in fatal and nonfatal recurrences of MI between patients who complied and those who quit the rehabilitation program (Comoss, 1988).

Cardiovascular disease is an expensive problem. The annual cost of cardiovascular disease in 1984 was estimated at 64.4 billion dollars (McMahon et al., 1986). Noncompliance is physically, socially, and financially costly (Miller et al., 1989).

Cardiac rehabilitation programs designed to increase patient knowledge and understanding have been successful in providing information. However, the prescribed behaviors of the medical regimen are frequently neglected after patients return to the societal role (Miller, Johnson, Garrett, Wikoff, & McMahon, 1982). If treatment requires substantial changes in life-style, patients find it difficult to comply to the recommended treatments of choice (Ventura et al., 1984). However, Hilbert (1985) reported post MI patients that actively participated in a cardiac rehabilitation program had significantly higher compliance rates than those who had stopped attending.

Few health education programs have been shown to successfully mediate lifestyle changes related to the control of established risk factors in coronary heart disease. This non-compliance may be related to failure to address individual differences in variables affecting preventative behavior such as social support systems, health locus of control, health values, and wellness motivation (Derenowski, 1988). Inpatient education programs for patients diagnosed with ischemic heart disease enhance knowledge of their condition. However, the type of knowledge most conducive to medical regimen compliance has not been determined (Mills, Barnes, Rodell, & Terry, 1985). Perhaps enhanced knowledge is not the best or only means of attempting to increase compliance. Personality characteristics need to be assessed in order to determine rehabilitation goals.

Individual perceptions of health locus of control, self-esteem, and health status influence health promotion behavior (Duffy, 1988). Locus of control is an important variable for nurses to understand. Knowing the patient's locus of control tendency enables the nurse to anticipate: how independent the patient will seek to become; how anxiety provoking the situational powerlessness will be for the individual; and the importance of mastering control-relevant health information (Miller, 1983). Effectiveness of treatment programs may depend on tailoring the program to an individual's locus of control (Miller, 1983). According to Shillinger (1983), in

the case of internally oriented individuals, a self-care approach may be optimal. However, externally oriented individuals may benefit from a more directive approach.

### Purpose

The purpose of this study was to examine the relationship of an individual's locus of control and health value to compliance to the prescribed rehabilitation regimen among post MI or post cardiac surgery patients.

## CHAPTER 2

### REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

#### Literature Review

Results from compliance studies are contradictory. Furthermore, measurements in different studies often are not comparable. The literature review focuses upon cardiac rehabilitation patient compliance, lifestyle changes, and other variables related to compliance. Locus of control and health value studies are also numerous and include a wide variety of patient populations studied. However, these studies also yield conflicting results.

Compliance Literature. Chang, Uman, Linn, Ware, and Kane (1985), in their study of elderly women, indicated that most investigations led to the conclusion that age was not significantly related to compliance. Contradictory findings have been reported regarding the relationship of education and compliance. Chang et al. (1985) found that increasing levels of education were associated with noncompliance.

In an article by Hussey and Gilliland (1989), positive and negative factors influencing compliance were identified. Seven factors have been found to have a positive effect upon compliance: (a) compliance with other aspects of the regimen, (b) is receiving other treatments for the same condition (one treatment reinforces the other), (c) family influence, (d)

family stability, (e) the perception of susceptibility to the disease, (f) the perception of the disease as serious, and (g) efficacy of therapy. Three factors have been found to have a negative effect on compliance: (a) long therapy duration, (b) number of concurrent drugs or treatments, and (c) side effects. Other factors have been associated with regimen compliance. These include attitudes and beliefs, consequences of noncompliance, ethnic or cultural matters, and language barriers.

A high degree of noncompliance is a general problem encountered whenever and wherever health-related behavior change is attempted. Comoss (1988), a nurse consultant for cardiac rehabilitation programs, identified factors associated with noncompliance among cardiac rehabilitation patients. Physical personal characteristics include smoking, blue-collar occupation, inactive leisure, overweight, angina, and low ejection fraction. Psychosocial personal characteristics which promote noncompliance include lack of spouse support, lack of self-motivation, mood disturbances, introverted personality, external locus of control, and extreme type A personality.

Hedback, Perk, and Perski (1985), in a retrospective study, investigated 143 MI patients participating in a newly developed cardiac rehabilitation program. The study revealed that compliance with a comprehensive post MI rehabilitation program, which included information, medical follow-up,

physical training, and psychologic support, lessened the nonfatal reinfarction rate (Hedback, Perk, & Perski, 1985). In addition, Comoss (1988) reports that lifestyle was significantly healthier with regard to diet, exercise, and general care of the body among those who participated in the rehabilitation program.

Promoting compliance in patients necessitates a greater degree of patient participation. Both the health professional and the patient need to actively contribute to the relationship. The health professional provides medical knowledge and the patient provides knowledge about his background. This mutual exchange of information leads to negotiation and mutual participation (Cameron & Gregor, 1987). Hilbert (1985), in a study of 60 MI patients and their spouses, concluded that patients should be encouraged to participate in a cardiac rehabilitation program since this factor is the best predictor of total compliance. Those who have stopped attending a cardiac rehabilitation program are at greater risk for non-compliance than those who are still attending (Hilbert, 1985).

Mills, Barnes, Rodell, and Terry (1985) sampled 342 patients admitted to a medical center with the diagnosis of ischemic heart disease (i.e., MI and/or angina) to evaluate the effectiveness of an inpatient education program. The results identified knowledge as the third most powerful predictor of compliance after attendance at patient education classes and group assignment. In addition, the study suggests

that the cardiac patient and the manner in which he or she is taught must be given as much emphasis as the content of the information that is communicated.

Intended and actual behaviors of cardiac rehabilitation patients have been studied extensively. Miller, Johnson, Garrett, Wikoff, and McMahon (1982), in a study of 27 cardiac rehabilitation patients, indicated there is little doubt that patient attitude, intention, and perception of family member expectation affect patient adherence to the medical regimen. Miller et al. (1989) investigated personal adjustment and regimen compliance one year after the MI. Eighty-one subjects participated. A significant decrease in regimen compliance and personal adjustment from hospital discharge to thirty days was identified, but no further change was identified from thirty to sixty days after infarction.

Perceived beliefs of others was the strongest predictor of compliance to the medical regimen in a study of 103 first time MI patients (Miller, Wikoff, McMahon, Garrett & Ringel, 1988). In addition, intentions during hospitalization, attitudes, and helpfulness of coping methods were predictive of adherence to the prescription for modification of stress response at 60 days post infarction (Miller et al., 1988). A study of 51 MI patients who participated in a five phase study over two years indicated that at two years post MI, perceived beliefs of others and personal attitudes were the major



indicators of compliance (Miller, Wikoff, McMahon, Garrett, & Ringel, 1990).

Miller, Wikoff, McMahon, Garrett, and Ringel (1985) reported that the point of intervention for providing information and discussing necessary situational adjustments to promote compliance appears to be post hospitalization. Findings indicate the need for review of the content of rehabilitation programs and for consideration of the more appropriate stage of recovery at which instructions are presented to patients rehabilitating from a MI (Miller et al., 1985).

Locus of Control/Health Value. Findings on the relationship between health locus of control and adherence to a therapeutic regimen have been mixed. Marsh-Jordon and Neutra (1985), in a study of 339 subjects participating in a lifestyle change program, found that adherence was related more often to an external locus of control than an internal locus of control. However, numerous studies have concluded that individuals with an internal locus of control show better compliance and more often participate in preventive health practices (Arakelian, 1980; Derenowski, 1988; DeVito, Bogdanowicz, & Reznikoff, 1982; Kist-Klein & Lipnickey, 1989; MacDonald, 1971; Muhlenkamp & Broerman, 1988; Zindler-Wernet & Weiss, 1987; Waller & Bates, 1992).

Zindler-Wernet and Weiss (1987) used an ex post facto research design to examine the relationship between health locus of control and preventive health behaviors. A

convenience sample of 123 campus employees was used. The research supported three hypotheses regarding locus of control. First, data suggested that individuals with a history of preventive health behaviors did not exhibit chance locus of control but did exhibit internal locus of control. Hypothesis two suggested that individuals who were motivated to seek a comprehensive appraisal of risks to their health exhibited beliefs that their own personal influence affected their health the most. Hypothesis three considered an individual's decision to initiate preventive behaviors. The results indicated that expectancies regarding health locus of control should not be considered in isolation of important environmental and experiential variables when attempting to understand an individual's decision to initiate recommended preventive health behaviors (Zindler-Wernet & Weiss, 1987).

Nemcek (1990) presented a literature review of health beliefs and preventive behaviors. Her review indicated there was a relationship between internal locus of control and taking preventive action. In addition, internally controlled individuals are more likely to assume responsibility for their health. The majority of study findings indicated that internal locus of control and health value were predictive of preventive health practices (Nemcek, 1990). Study findings, as summarized by Nemcek (1990), indicated that persons who valued health and who perceived themselves as able to

influence their own health status were more likely to engage in preventive health practices.

Kist-Klein and Lipnickey (1989) used a descriptive analysis to illustrate that health locus of control may be affected by different variables, such as health value, education, age, disease, social support, and self-esteem. This finding suggests that assessment of health locus of control should be multivariate. Merely possessing an internal locus of control may not be enough to affect behavior change (Kist-Klein & Lipnickey, 1989). Weight loss, smoking cessation, and adoption of other preventive behaviors is more prevalent in individuals perceiving themselves as being in control -- an internal locus of control.

The way people perceive their ability to change or control their life has a major impact on their willingness or ability to comply with medical treatment (Hussey & Gilliland, 1989). Locus of control theory has been used to analyze and predict an individual's likeliness to comply. Research suggests that internally oriented individuals are more likely to be (1) health oriented individuals and desire physical well-being, and (2) to comply with a recommended health regimen (Hussey & Gilliland, 1989).

Research has been done to study locus of control and information seeking behaviors. Information seeking behavior is often viewed as an important step in the direction of lifestyle changes. DeVito et al. (1982) sampled 90

undergraduate college students. The students were told their participation in the proposed research would assist in the development of a hypertension clinic. The subjects completed the Health Locus of Control Scale and the Health Value Survey. Data indicated that externals who scored high in health value chose significantly fewer health information pamphlets than any other group. The investigators explain this by stating that a person who is external in health locus of control orientation and who simultaneously values health, denies vulnerability to the condition and consequently intends to obtain fewer pamphlets. DeVito et al. (1982) recommended that if health locus of control is to be an important variable in health-related behaviors, it would be important to study health locus of control in relation to actual health behaviors. Wallston and Wallston (1981) reported that studies in health locus of control beliefs and health-related information seeking established that persons who highly valued health and were classified as internals indicated a willingness to read more hypertension-related information.

To date research has been presented which supports Rotter's (1972) locus of control theory. This theory indicates that individuals with an internal locus of control are more apt to seek information, participate in health promotion activities, initiate preventive practices, and comply to a medical regimen. The relationship among health value, health locus of control, and compliance with the medical regimen is

controversial. Research which presents an opposing view to the locus of control theory will now be presented.

Derenowski (1988) sampled a group of 106 post MI patients to test the relationships among social support systems, health locus of control, health value, and wellness motivation during cardiac rehabilitation. The findings of the study indicated that health locus of control was not related to wellness motivation during the early phases of cardiac rehabilitation. Within the later phases of rehabilitation, a significant positive correlation was shown between health care provider control over health and wellness motivation indicating an external locus of control related to wellness motivation (Derenowski, 1988).

Brown, Muhlenkamp, Fox, and Osborn (1983) researched the relationship of health locus of control, health values, and health promotion behavior using a convenience sample of 67 individuals from a church social group. Due to the nonrandomness of the sample, the author claims the findings should be cautiously interpreted. Individuals with an internal locus of control were not found to have a significantly greater relationship to health value and health related information seeking behavior in this study. Brown et al. (1983) gives three possible explanations for this finding. First, the study asked participants to report on information seeking behavior they engaged in; whereas previous studies asked individuals to report on their intentions. This suggests an individual's

intention to engage in an activity may not necessarily translate into an individual's actual behavior (Brown et al., 1983). Second, study findings may vary due to the use of different scales to measure locus of control. Finally, individuals who are more internal may rely more on internal forces and thus seek less outside information.

Muhlenkamp and Broerman (1988) investigated the relationship among health beliefs, health values, and positive health behaviors. Clinic patients (172) were sampled. The majority of the subjects were visiting the clinic for health promotion, health prevention, or health maintenance reasons. The Multidimensional Health Locus of Control Scale (Wallston, Wallston, & DeVellis, 1978) was one of the instruments used. Internal locus of control was not found to affect health behaviors in this study.

A study investigating the relationship of health locus of control to lifestyle change programs was done by Marsh-Jordon and Neutra (1985). Three hundred thirty nine participants in a lifestyle change program were sampled. No significant relationship was found between internal locus of control and changes in physical parameters. Physical parameters in this study included weight, blood pressure, low density lipoproteins, triglycerides, and the ratio between cholesterol and high density lipoproteins. Compliance is influenced by several variables, two of which are locus of control and health values. However, how health values and locus of control

influence compliance is controversial. The degree of responsibility for health may rely upon whether individuals believe they can actually affect their health by using preventive health behaviors and lifestyle changes.

### Theoretical Framework

Social learning theory is the theory that served as the basis for this study. J. B. Rotter is the social learning theorist of interest to this study because of his work in locus of control. A brief description of the main concepts will be delineated with an application to the variables under investigation.

The emphasis of social learning theory is on learning rather than inherent characteristics and on social surroundings rather than internal dispositions as the determinant of behavior (Maddi, 1989). Rotter, Chance, and Phares (1972) investigated the understanding of the probability that a particular act will occur. Rotter et al. (1972) calls this probability the behavior potential. Behavior potential is defined as a function of both expectancy that reinforcement will follow the behavior and the perceived value of the expected reinforcement (Maddi, 1989). Expectancies and perceived values are internal, mental events that are given the role of jointly determining whether or not action will take place. According to Maddi (1989), Rotter deals with a subjective rather than objective basis for predicting behavior. Expectancy and perceived value are considered individualized.

Individual differences stem not merely from instincts or underlying motives; rather it is believed such differences strongly reflect differences in previous experience (Maddi, 1989).

Rotter et al. (1972) postulates that a particular behavior is more likely to occur if it is associated with high reinforcement value and expectancy. Reinforcement value is the degree of preference for a particular reinforcement if various alternative reinforcements are available. Expectancy is the probability that the particular reinforcement will occur as a result of an individual's behavior (Laffrey & Isenberg, 1983)

The term locus of control describes the degree to which the reinforcement is contingent on one's own behavior or controlled by other persons, chance, fate, or luck. The effect of reinforcement following some behavior on the part of the individual is not a simple "stamping" process but depends upon whether or not the person perceives a causal relationship need not be all or none but can vary in degree. When a reinforcement is perceived by the subject as following some action of his own, but not being entirely contingent upon his action, then it is typically perceived as the result of luck, chance, fate, or under the control of powerful others. When the event is interpreted in this way the individual is said to have an external locus of control. If the individual perceives the event as contingent upon one's own behavior or one's own



relatively permanent characteristics, it is termed a belief in internal control (Rotter et al., 1972). Locus of control is hypothesized to be of major significance in understanding the nature of learning processes in different kinds of learning situations (Rotter et al., 1972).

Considerable research has been done investigating internal locus of control. According to Maddi (1989), typically persons with an internal locus of control at a personal level are more individualistic, assertive, interested in gaining knowledge, and are willing to rely on their skill in risky situations than are persons who believe they are externally controlled. At the societal level, persons with internal locus of control are more concerned with social problems and more active in attempting to solve them than are persons who are externally controlled (Maddi, 1989).

Compliance and health values also fit into the framework. Compliant behavior is more likely to occur if it is associated with a high reinforcement value and expectancy. Therefore, noncompliant behavior occurs when the prescribed regimen is thought to be incapable of yielding the desired reinforcement. For example, an individual will continue to smoke if it is believed that no harm or change in health will occur if the smoking continues. Health values, like locus of control, are learned and influenced by social surroundings. In addition, how an individual values health can reflect life experiences.

Reinforcement value and expectancy also play a part in determining the value one places on health.

An MI patient is thrown into an entirely new situation in which values, reinforcements, potential outcomes, and necessary changes in lifestyle must be identified. The patient must determine if prescribed changes in behavior will yield outcomes that are highly valued forms of reinforcement (i.e., improved health, prolonged life). However, if prescribed behavior changes do not yield outcomes that are valued, the patient may opt not to attempt changes.

Identifying an individual's locus of control and health value is an important step for educational purposes in cardiac rehabilitation programs. The purpose of incorporating locus of control into care is not to label the patient, but to gain insight into their orientation to guide nurses. In addition, the content and expectations of the rehabilitation program must be congruent with the individual's value of health.

### Research Questions

The questions investigated were:

- 1) Do male cardiac patients with a high value for health demonstrate more compliant behavior with the cardiac rehabilitation regimen than patients with a low value for health?
- 2) Do male cardiac patients with an internal locus of control demonstrate more compliant behavior with the

cardiac rehabilitation regimen than patients with an external locus of control?

### Hypotheses

The research questions stimulated the following hypotheses:

- 1) Cardiac patients with an internal locus of control are more compliant with the prescribed cardiac rehabilitation regimen than individuals with an external locus of control.
- 2) Cardiac patients with a high value for health are more compliant with the prescribed cardiac rehabilitation regimen than individuals with a low value for health.

In addition to the above hypotheses, the additive influence of health locus of control and health value with compliance to the prescribed cardiac rehabilitation regimen was examined.

### Definitions

- 1) Cardiac Rehabilitation Program: Cardiac rehabilitation is ordered by the physician and a multidisciplinary team carries out the program objectives. The hospital completes all phase-one education before the patient is discharged to home. Education is provided by means of classroom instruction, films, and review of written literature. Class topics include anatomy/physiology, stress, nutrition, exercise/home walk program, and risk

factor identification/reduction. The registered nurses who staff the cardiovascular unit provide the classroom instruction (which includes visual aids and films). The written literature is reinforced on an individualized basis at the patient's bedside. The staff nurses are trained by the cardiovascular unit nurse educator. A registered dietitian presents the class content regarding nutrition. In addition, a social worker provides spouse support groups weekly and individual family support on a referral basis. There are three phases of cardiac rehabilitation:

- a) Phase one is primarily an inpatient phase of cardiac rehabilitation. Basic information on diet, exercise, anatomy/physiology, risk factors, stress modification, and medications are provided to patients. Patients begin ambulation and range of motion exercises on the unit.
- b) Phase two is one of the outpatient phases of cardiac rehabilitation. This phase begins four weeks after discharge to home and continues twelve weeks (or 36 sessions). Phase two is a monitored exercise program. The patient is monitored by staff and equipment. Education is individualized being based on individual's questions.

c) Phase three is the final outpatient cardiac rehabilitation phase. It is a maintenance phase which begins after completion of phase two and can continue indefinitely. Education in this phase is in the form of answering questions, which are generated by the patients experiences at home. Exercise is monitored by staff, but not by equipment.

2) Compliance: Behavior in which an individual initiates and actively carries out the prescribed lifestyle changes over time. Lifestyle changes include diet, exercise, stress management, smoking cessation, and medication regimen.

3) Locus of Control: A personality factor developed over time and acquired through a series of social learning experiences. There are two types:

a) Internal locus of control is the perception that actions or attributes of the individual control what happens.

b) External locus of control is the perception that luck, fate, or chance (termed chance locus of control) or powerful others (termed powerful others locus of control) control what happens to an individual.

4) Myocardial Infarction: An "MI" occurs in cardiac muscle when coronary vessels occlude resulting in muscle death. Elevated cardiac isoenzymes and ECG changes indicative of an MI are used to confirm the suspected diagnosis of an MI.

5) Cardiac Surgery: A procedure used to shunt blood around stenotic portions of major coronary arteries. This surgery is known as coronary artery bypass graft surgery (CABG).

6) Patient: A person under the care of nurses, physicians, and other health care providers... a receiver of care... a holistic being... a self-care agent. In this study a patient is of male gender. An MI is often considered a male-specific disease and as such research and rehabilitation programs are targeted toward this group (Johnson & Morse, 1990). The number of women who have an MI is substantial and their experience cannot be ignored. However, for the sake of decreasing extraneous variables, only men were enrolled in this study.

7) Health Value: Health values are the individual standards upon which choices concerning health behaviors are based.

## CHAPTER 3

### METHODOLOGY

In this chapter the design of the study, as well as a description of the sample and setting are presented. Demographic data collected during the course of the study is described. The Multidimensional Health Locus of Control Scale (MHLC), the Health Value Survey, and the Health Behavior Scale were the instruments used in the study. These instruments, as well as the data collection procedure, are presented in this chapter.

#### Research Design

This research was conducted using a descriptive type of ex post facto research design. The independent variables were health value and health locus of control. The MHLC scale and the Value Survey measured the independent variables. These questionnaires were administered one-to-two days prior to discharge. The dependent variable, compliance, was measured with the Health Behavior Scale thirty days post-discharge from the hospital.

#### Sample and Setting

A convenience sample of thirty-eight subjects was selected from a 410-bed hospital with a pre- and post-discharge cardiac rehabilitation program. Forty-two potential subjects were identified by three interviewers over a seven month period of time. Two subjects refused to participate in the

study, one due to lack of interest and one due to excessive fatigue. Of the forty remaining subjects, two failed to complete the Health Behavior Scale leaving a sample size of thirty-eight.

All subjects met the following criteria: experienced first MI and/or CABG; male, aged 40-70 years; able to speak, read, and write English; oriented to person, place, and time; not a health care worker; and currently participating in phase one of cardiac rehabilitation with intent to begin phase two three to four weeks after discharge. Individuals were excluded if they were being discharged to somewhere other than their home. This excluded individuals going to foster homes, nursing homes, or other inpatient services. Individuals going to live with a family member (e.g., sister, brother, parents, or cousin) during the early discharge period were also excluded. These individuals were excluded because they may have been forced to maintain a lifestyle similar to the family members with whom they were staying. In addition, their behavior as a guest in someone else's home might have been different than their behavior at home. In this study, 36 subjects returned to their homes to live with their spouses. One returned to his home alone and the other returned to his home with children living with him.

The subjects were all males between the ages of 42 and 70 (mean age of 56 years). The ethnic background of the sample was predominantly Caucasian. One subject indicated he was



Mexican and the remaining two indicated "other." The reported educational background varied from four years to 20 years of education with a mean of 13.4 years.

Twelve of the subjects (32.6%) were retired. Individuals in labor and service occupations made up 23.7% of the sample. One subject (2.6%) was a craftsman, six subjects (15.8%) were proprietors, four subjects (10.5%) were professionals, and the remaining six subjects (15.8%) were in executive or management roles.

The majority of the subjects (94.7%) were married. The remaining 5.3% were divorced. None of the subjects reported being single or widowed. Thirty-six of the subjects (94.7%) lived with a spouse in their own homes. One subject lived with his children and one subject lived alone. No subjects reported living with a significant other.

The history of chronic illness of the subjects is presented in Table 1. Admission data was reviewed to identify if the subjects had a history of any of these chronic illnesses. Hypertension (29%), history of a previous MI (21%), arthritis (18%), and hyperlipidemia (16%) were the most frequently occurring chronic illness. The chronic illnesses in this sample are comparative to other studies. Gout and headaches were not identified as commonly occurring chronic illnesses in other studies. However, they were reported in this sample. Obesity and respiratory diseases were identified in other studies, but neither were reported in this sample.

Table 1

Admission Data Analysis of  
History Of Chronic Illness

Illness	n	Percent
Hypertension	11	29%
Myocardial Infarction	8	21%
Arthritis	7	18%
Hyperlipidemia	6	16%
Orthopedic Problems	4	11%
Gastrointestinal Disorders	4	11%
Kidney Disease	4	11%
Diabetes	3	8%
Cancer	3	8%
Gout	2	5%
Congestive Heart Failure	1	3%
Stroke	1	3%
Headaches	1	3%

Table 2 shows the complications of post-myocardial infarction and post-coronary artery bypass grafting. This sample, in comparison to other studies, demonstrated very few complications. Arrhythmia was the most frequently identified

complication (18%). Other studies reported congestive heart failure, wound infection, and embolus as significant complications.

Table 2

Complications Post-Myocardial Infarction  
and Post-Coronary Artery Bypass Grafting

Complication	n	Percent
Arrhythmia	7	18%
Respiratory Failure	2	5%
Electrolyte Imbalance	2	5%
MI	1	3%
Low Hemoglobin	1	3%
Stroke	1	3%
Hypotension	1	3%

Note. One patient had two complications, however the remaining 37 only had one type of complication.

The demographic data identified in this study closely resembles other research studies (Miller et al., 1989; Derenowski, 1988; Marsh-Jordon & Neutra, 1985; Brown et al., 1983). However, some differences are worth noting. This study included only male subjects. In addition, there were no research studies found during the literature review process

that collected data about living arrangements. Thus, it was not possible to compare this study's living arrangement data to other studies. The educational level (mean 13.4 years) is higher than what was reflected in other studies (i.e., less than 12 years). The occupations of the subjects (33% retired, 42% executive, professional, proprietors) reflect a more white collar sample. Finally, very few chronic illnesses and complications were identified.

### Instruments

The Value Survey, Health Behavior Scale, and Multidimensional Health Locus of Control Scale were the three instruments used in this study. In addition, a demographic data instrument was utilized.

The demographic data tool, developed by the investigator, collected information about the patient's age, ethnic background, completed education, current occupation, marital status, living arrangements, history of chronic illness, and complications of MI and/or CABG (Appendix A). This information was used to describe the sample. The interviewer collected data with this tool by means of chart review or patient interview.

The Value Survey developed by K. A. Wallston in 1974 (Wallston, 1990), measures how individuals value health. Wallston chose 9 out of 18 of Rokeach's 18 terminal values and added health as a tenth value (Appendix B). The scale consists of ten values (e.g., health, happiness, freedom) which

the individual is asked to rank in order of importance. The number "1" indicates the most important value and the number "10" the least important value. The rank individuals identified for health was utilized to classify individuals as either high or low health valuers.

A case can be made that the Value Survey does measure what it purports to. However, validity is tenacious and difficult to pin down (Wallston, 1990). The argument, according to Wallston (1990), rests on the following:

- 1) Moving toward construct validity, there are enough studies published in the literature which used the Value Survey and which found that it operates as one would theoretically expect it to.
- 2) Different subsamples tend to rank health differently.
- 3) A 4-item Likert scale which measures health value has been administered simultaneously with the Value Survey. The two scores correlated significantly although correlation coefficients ranged from .3 to .4.

There can be no estimate of internal consistency, since the scale uses rank ordering and stability has not been checked on a test-retest basis (Wallston, 1990). Laffrey and Isenberg (1983) claim that even though there is no validity or reliability data available for the Value Survey, the original Rakeach scale shows satisfactory test-retest reliability ( $r = .70$ ) and predictive validity.

The Health Behavior scale (HBS), a modification of the Health Intention scale (HIS), was developed by Miller et al. (1982) to measure patient compliance to the medical regimen. Intention statements of the HIS were changed to behavior statements (i.e., "If I am at home, I follow my diet" was changed to "When I am at home, I follow my diet"). The scale contains five sections of statements pertaining to actions related to following prescribed diet, limiting smoking, following recommended activity, taking medications, and modifying responses to stressful situations. Each section has two parts: part A includes statements related to carrying out the action in different environments; and part B includes statements about other people's thoughts toward carrying out the action in different environments. Each of the five sections contains eight questions for a total of 40 questions. In this study only part A was used for a possible total of 20 questions (Appendix C). Each question is rated on a five point Likert-type scale with number "1" indicating it is unlikely the patient is performing the actions and "5" indicating it is likely the patient is performing the action. The possible total score ranges from 20 to 100 using only part A (possible subscale scores range from 4 to 20) with the higher scores indicating compliance with the five behavior components and lower scores indicating noncompliance.

Because validity of self reporting is questionable, Miller and her colleagues administered the scale to a family

member to verify the patient's statements. Using tests, no significant differences were found between patient and spouse reports of medical regimen adherence (Miller et al., 1988). McMahon et al. (1986) states the HBS and HIS are validated from literature and by experts in fields of medicine, sociology, psychology, and nursing. Alpha reliability coefficients, in the study by Miller et al. (1988), for the five HBS subscales ranged from .82 to .92. In an earlier study, alpha reliability coefficients ranged from .81 to .99, indicating the HBS is reliable (Miller et al., 1982).

In this study a Cronbach's Alpha was computed to evaluate the internal consistency of the HBS items. The reliability coefficients were .87 for diet-related items, 1.0 for smoking items, .90 for activity items, .95 for medication items, and .91 for recreation items.

The Multidimensional Health Locus of Control (MHLC) Scale is used to measure health locus of control (Appendix D). The instrument was developed by Wallston, Wallston, and DeVellis (1978). The development sample consisted of 115 subjects recruited from Nashville's Municipal Airport and represented a cross-section of the population (Wallston & Wallston, 1981).

The instrument consists of three subscales that measure internal, chance, and powerful others locus of control (chance and powerful others are types of external locus of control). There are two equivalent forms of the instrument -- Form A and Form B. Form A, which was utilized in this study, consists of

three subscales containing six items each. Each scale is in a six-point Likert format on an agree-disagree continuum. Possible scores of the subscales range from 6 to 36 with scores representing the beliefs individuals have about different types of influence on their health status (Zindler-Wernet & Weiss, 1987). The MHLC scales are intended for use with adults. Individuals with an eighth grade reading level or better should be capable of understanding and responding to the items (Wallston, Wallston, & DeVellis, 1979).

Hallal (1982) studied the relationships between health beliefs, health locus of control, and the practice of self-breast examination. In the study using Form A test-retest reliability, coefficients were .69 for the internal subscale, .75 for the powerful others subscale, and .69 for the chance subscale. The instrument demonstrated predictive validity in that there was a positive correlation between a high score on the internal subscale and good health status (Hallal, 1982).

Derenowski (1988) reported alpha coefficient values to determine subscale reliability ranging from .79 to .81. In addition, two week test-retest reliability coefficients ranged from .76 to .84. Construct validity, according to Derenowski (1988), has been obtained with exploratory factor analysis. Wallston and Wallston (1981) report alpha reliabilities for the MHLC subscales ranged from .67 to .77. When Forms A and B are combined, the alpha reliability coefficients ranged from .83 to .86. Concurrent and discriminant validity were



established by correlating the MHLC scales with Levenson's I, P, and C scales (Wallston & Wallston, 1981).

Two ways in which the MHLC scales are superior to the Health Locus of Control (HLC) scale (Wallston, Wallston, Kaplan, & Maides, 1976) have been identified. First, the MHLC scales are more internally consistent than the HLC scale. Secondly, the HLC scale contains only one question regarding powerful others, whereas the MHLC scale has an entire subscale devoted to the powerful others construct (Wallston & Wallston, 1982).

### Procedure

Three interviewers were used to collect data for this study. The three registered nurses worked on the unit where cardiac rehabilitation phase one occurred. All three participated in a two-hour training session to prepare them for data collection. The purpose of the study, subject inclusion criteria, verbal script, and confidentiality were the topics discussed. At the end of the training session, they signed an assistant investigator agreement (Appendix E).

In recruiting subjects the interviewer reviewed the daily census of the cardiovascular unit chosen. After identification of subjects who fit the study's inclusion criteria, the interviewer approached the individuals with the verbal script (Appendix F). Individuals agreeing to participate then signed a written consent form and received a copy of the form (Appendix G).

One to two days prior to discharge the interviewer met with the patient in the patient's room or a nearby private lounge. The Multidimensional Health Locus of Control Scale and the Health Value Survey were administered initially by one of the interviewers. The directions were read aloud as the patient read along. Any questions were answered at that time. The interviewer then left the room and allowed the patient to complete the scales in privacy. After 45 to 50 minutes the interviewer returned to collect the completed scales and reminded the subject about the third instrument.

Four weeks after discharge, the patient received the Health Behavior Scale in the mail to complete at home. A follow-up letter and an addressed, stamped envelope were mailed with the questionnaire (Appendix H). The follow up period of four weeks was chosen because of study findings of Miller et al. (1988). They reported that there was a significant decrease in mean score for all variables (regimen prescriptions, attitudes, coping) from hospital to thirty days, but no change from thirty to sixty days.

#### Protection of Human Subjects

This study poses little risk to the patient, but two potential risks were identified. First, the time involved in interviewing the patient and completing the scales might have tired the patient. Methods used to reduce this risk included: (a) observe for signs of fatigue and terminate the meeting if necessary, (b) make an appointment with the patient for the

best time of day to receive instructions and complete the scales, (c) keep meetings short, and (d) approach the patient mid-morning or after rest periods.

The second risk identified was the possibility of a break in confidentiality. Questionnaires were coded in a manner that no names were attached to answer forms. In addition, patients who participated in the study were not the topic of conversation with staff, physicians, or any other individual.

## CHAPTER 4

### RESULTS

Two hypotheses and research questions were addressed based on the data collected. T-tests were used to analyze the two hypotheses. Stepwise multiple regression was used to answer the additive influence of the research questions. Unfortunately, no statistically significant results were obtained. The following is a more detailed account of the analysis process.

#### Analysis of Research Hypothesis

The first hypothesis stated that individuals with an internal locus of control would be more compliant with the prescribed cardiac rehabilitation regimen than those with an external locus of control. This hypothesis was analyzed using a t-test. Group one (internals) and group two (externals) were compared on the dependent variable (compliance). All Locus of Control raw scale scores were converted into standard scores (T scores). Subjects were labeled as internal or external depending on which of the standardized scores was the highest. The external group included the individuals who scored the highest on the chance or powerful others subscales of the MHLC scale.

Prior to performing a t-test, the following procedure was used to determine the compliance score. A mean score was computed because not every section of the HBS was applicable to

every individual (i.e., retired individuals did not complete the work-related questions). Average scores were assigned to the work-related questions of the retired subjects. If three out of the four questions were answered in a particular section of the HBS, the average value of the three questions was assigned to the fourth question. For example, a retired individual answered the home, sports, and social questions related to diet. The question related to diet at work was not applicable and left blank. The average of the first three questions related to diet was assigned to the fourth question related to diet at work.

The smoking section data of the HBS was not used in the analysis process. Inclusion of this data may have distorted the compliance results. Many individuals left this section blank and indicated it was either "not applicable" or "I don't smoke". Only one patient out of 38 responded appropriately to the smoking section.

Table 3 presents results of the t-test for comparison of the two locus of control groups with respect to compliance. Hypothesis one was not supported. The t-test result indicated no significant differences between the internal locus of control group and the external locus of control group in relation to their compliance to the cardiac rehabilitation regimen ( $p > .05$ ). The mean MHLC subscale scores for the total sample were: Internal, 27.5; Powerful Others, 19.7; Chance, 13.4. All of these means are close to the normative means of 26.5,

18.3, 15.0, respectively, established by Wallston and Wallston (1978).

Table 3

T-Test for the Comparison of Compliance to the Two Locus of Control Groups

	Mean	SD	df	t	P
Internal LOC (n = 32)	68.34	7.214			
			36	.05	.963
External LOC (n = 6)	68.50	8.597			

Hypothesis two was also tested using a t-test. This hypothesis postulates that cardiac patients with a high value for health are more compliant with the prescribed cardiac rehabilitation regimen than individuals with a low value for health. High health valuers and low health valuers were compared on the dependent variable compliance.

There was little variability noted in how subjects valued health. During their hospitalization, all subjects ranked health between one and five out of ten possibilities (with one indicating the highest value of health). Forty-five percent of the sample ranked health as a one. Health was ranked as a two by 18% of the subjects. The remaining 37% ranked health as a three, four or five. In order to create two groups (high

and low health valuers), subjects ranking health as one were grouped as high health valuers. Subjects ranking health between two and five were grouped as low health valuers. The data is comparable to other studies. Brown et al. (1983) reported that 30% of their subjects ranked health as their highest value, 22% ranked health second, and the remainder of the sample ranked it third.

The t-test results for the comparison of the two health value groups is presented in Table 4. This hypothesis was not supported. No significant differences were noted between high health valuers and low health valuers in their compliance to the prescribed cardiac rehabilitation regimen ( $p > .05$ ).

Table 4

T-Test for Comparison of Compliance to Health Value Groups

	Mean	SD	df	t	P
High Health Valuer (n = 17)	67.65	7.818			
Low Health Valuer (n = 21)	68.95	7.032	36	.54	.592

In addition to the hypothesis testing, the additive influence of the research questions investigating the relationship of locus of control and health value to

compliance, was examined by multiple regression analysis. Multiple regression analysis was used utilizing internal locus of control, chance locus of control, powerful others locus of control, and health value as independent variables and compliance as the dependent variable. The results of the multiple regression of health value and locus of control variables upon compliance indicated that none of the variables were significant factors in explaining the variance of compliance ( $p > .05$ ).

The subjects were compliant as evidenced by the scores of the HBS. When asked if they would comply with diet modifications in the four different situations, 72% of the subjects indicated slightly likely to likely. Eighty-eight percent indicated they were slightly likely or likely to comply with the activity regimen. All subjects (100%) indicated they were likely to comply to the prescribed medication regimen. However, only 65% of the subjects indicated they were slightly likely or likely to modify their responses to stress. The compliance to limiting smoking behaviors was not determined because of the questionable data collected in this area.

Miller et al., (1982) also reported the strongest compliance behaviors in the areas of medication and activity. In addition, McMahon et al, (1986) reported strong compliance behaviors in all four areas of the HBS (home, work, sports, social).



CHAPTER 5  
DISCUSSION AND IMPLICATIONS  
FOR NURSING PRACTICE

Discussion

The relationship of health value and locus of control to compliance in a cardiac rehabilitation program was examined in this study. No statistically significant relationships were identified. However, trends were identified. Most of the subjects were identified as having an internal LOC. In addition, all subjects valued health a great deal.

The results of this study are similar to other research studies. The questionnaires used and the demographic data collected also resembles other studies. The results of this study, when examined with the others, may be more meaningful. Brown et al. (1983), Marsh-Jordan and Neutra (1985), and Zindler-Wernet and Weiss (1987) all reported homogeneous samples with a larger number of internal locus of control subjects and thus could not significantly demonstrate the relationship between compliance and the locus of control groups. Brown et al. (1983) demonstrated that their sample was a very high health valuing group, as was true in this study. Furthermore, they found health value was not significantly related to compliance behavior among subjects.

The reason for the statistically insignificant results and the contradictory findings of compliance research may be

directly linked to J. B. Rotter's Social Learning Theory. Rotter et al. (1972) postulates that a particular behavior (i.e., compliance) is more likely to occur if it is associated with the expectancy that reinforcement will follow the behavior and the perceived value of the reinforcement is great. Expectancy and perceived value are considered individualized and strongly reflect differences in previous experiences (Maddi, 1989). If this is true, numerous psychosocial and personality characteristics of the subjects would need to be observed simultaneously to significantly impact compliance. Individuals with an internal locus of control and a high value for health may differ significantly with respect to compliance to a cardiac rehabilitation regimen because of other psychosocial, personality, and previous life experiences.

Compliance is important for post MI and post CABG patients. In a study by Hedback, Perk, and Perski (1985), the nonfatal reinfarction rates of post MI patients was lower in the group participating in a cardiac rehabilitation program. According to Miller (1983), the effectiveness of treatment programs may depend on tailoring the program to an individual's locus of control. The emphasis of Social Learning Theory on learning and social surroundings influencing behavior suggests that any attempts at individualizing a cardiac rehabilitation program may lead to increased compliance. The subjects were compliant at 30 days post

hospitalization. Scores in the areas of medication and activity were the highest. This may be the result of the subjects being enrolled in a phase one cardiac rehabilitation program and these were the prescribed regimens they most clearly understood. In a study by Miller et al. (1989), it was demonstrated that by the 30-day period post hospitalization personal adjustment and compliance stabilized and remained the same at 60 days, one year, and two years.

#### Limitations

The sample size may have been too small to identify statistically significant relationships. In addition, the results of the demographics, such as education in years, race, and marital status were quite homogeneous and may suggest the general population was not represented. Only one hospital was used to gather potential subjects. This hospital serves patients from a very homogeneous area. There is little cultural and demographic diversity. Therefore, generalizability of findings from this study to other samples and other settings is limited.

The HBS did not facilitate the investigators in collecting data on the patient's smoking history. Most of the subjects marked the smoking section "not applicable" or left it blank. It was not possible to determine if the patient had ever smoked, smoked until their MI or CABG, or were currently smoking and left the section blank. Therefore, the smoking section data was not utilized in this study.

Finally, there was not enough variability in the locus of control and health value data from the sample to explain the research questions. It is important to note that all 38 subjects valued health, ranking it between one and five out of ten possibilities. In addition, 32 of the 38 subjects were identified as having an internal locus of control. This resulted in an external locus of control sample size too small (n = 6) to compare group difference in compliance. With a larger sample size and less homogeneity in demographic data, significant relationships may have been identified.

#### Recommendations for Further Research

This study and others are only looking at a small piece of a compliance continuum. Numerous variables have been determined to impact compliance to cardiac rehabilitation. However, as discussed in the literature review, results tend to be inconsistent. These variables need intensive study in a larger, more diverse population to determine how they interact and which are predictors of compliance behavior. It will be important to continue investigation to determine if interrelationships of variables can be found.

Compliance and health value data should be collected at 30 days, 6 months, and one year. Thirty-day compliance and health value results may not reflect actual behavior change which may or may not occur months later. Miller et al. (1989) reported of their original sample (n = 115), 82 smoked at the time of their MI, 16 at 30 days, 22 at 60 days, and 29 at one

year. It could be hypothesized that how people value health could also change the longer they are out of the hospital. Hence, the Health Value Survey and the HBS should also be administered at different time intervals post hospitalization.

A more complete smoking history should be obtained in future studies. The data collected from the smoking section of the HBS does not reflect 1) whether or not the subject currently smokes, 2) when the subject quit smoking if he had smoked, and 3) how much the subject currently smokes. Many subjects answered "5" to all smoking items indicating likely to comply because they currently did not smoke. This was very misleading. The only way this was made apparent was because the subjects wrote notes in the margins of the HBS. Smoking is a behavior which is difficult to overcome and has been shown to significantly impact an individual's health. It is important to identify clear and concise smoking data to correlate with other variables.

#### Applications to Practice

If interrelationships of variables could be identified, such as locus of control and health value to compliance in cardiac patients, specific information about the patient would be provided to health care team members. This would allow an individualized rehabilitation program to be developed.

There needs to be an increased awareness of the educational needs of the cardiovascular patient. With current trends in health care toward cost containment, decreasing

lengths of stay, and an increased focus on outpatient services, any research regarding nursing efforts to educate patients deserves attention. Currently, results regarding variables which impact compliance are inconsistent. Thus continued research must occur, with larger and more diverse samples, to identify clear answers which will allow nurses to significantly impact patient education.

## APPENDICES

Appendix A

Investigator: \_\_\_\_\_ Subject Code #: \_\_\_\_\_

DEMOGRAPHIC DATA FORM

The following data is to be collected by the investigator by means of chart review or interview.

1. AGE (in years): \_\_\_\_\_
2. ETHNIC BACKGROUND: \_\_\_\_\_
3. COMPLETED EDUCATION: \_\_\_\_\_
4. CURRENT OCCUPATION: \_\_\_\_\_
5. MARITAL STATUS: \_\_\_\_\_
6. LIVING ARRANGEMENTS: \_\_\_\_\_  
\_\_\_\_\_
7. HISTORY OF CHRONIC ILLNESS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
8. COMPLICATIONS OF MI/CABG: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Appendix B

Investigator: \_\_\_\_\_ Subject Code #: \_\_\_\_\_

VALUE SURVEY

Below you will find a list of ten values listed in alphabetical order. We would like you to arrange them in order of their importance to YOU, as a guiding principle in YOUR life.

Study the list carefully and pick out the one value which is the most important to you. Write the number "1" in the space to the left of the most important value. Then pick out the value which is second most important to you. Write the number "2" in the space to the left. Then continue in the same manner for the remaining values until you have included all ranks from 1 to 10. Each value would have a different rank (or number).

We realize that some people find it difficult to distinguish the importance of some of these values. Do the best you can, but please rank all 10 of them. The end result should truly show how YOU really feel.

- \_\_\_\_\_ A COMFORTABLE LIFE (a prosperous life)
- \_\_\_\_\_ AN EXCITING LIFE (a stimulating, active life)
- \_\_\_\_\_ FREEDOM (independence, free choice)
- \_\_\_\_\_ HAPPINESS (contentedness)
- \_\_\_\_\_ HEALTH (physical and mental well-being)
- \_\_\_\_\_ INNER HARMONY (freedom from inner conflict)
- \_\_\_\_\_ PLEASURE (an enjoyable, leisurely life)
- \_\_\_\_\_ SELF-RESPECT (self-esteem)
- \_\_\_\_\_ SENSE OF ACCOMPLISHMENT (lasting contribution)
- \_\_\_\_\_ SOCIAL RECOGNITION (respect, admiration)

Appendix C

HEALTH BEHAVIOR SCALE  
Patients with Heart Conditions

Subject Code #: \_\_\_\_\_

**Instructions:** This questionnaire contains five sections of statements pertaining to actions of following prescribed diet, limiting smoking, following recommended activity, taking medications, and modifying responses to stressful situations which the doctor and nurse recommended to you to help your heart condition. Each statement has five spaces for indicating the extent you believe you carried out the actions during the past four weeks at home, work, and while participating in sports or recreational activities and social activities. The rating scale for indicating this ranges from one to five with number "1" indicating that it is **unlikely** you are performing the action to number "5" indicating that is **likely** you are performing the action. If an action in any section does not apply to you, skip that section and go on to the next. It will be very helpful to us if you answer as many statements as possible.

EXAMPLE:

	unlikely			likely	
If I become very ill, I will go to the hospital.	1	2	3	4	5
		x			

SECTION I -- ACTION: FOLLOW THE DIET PRESCRIBED BY MY DOCTOR  
(including alcohol)

	unlikely			likely	
1. When at home, I follow the prescribed diet.	1	2	3	4	5
2. When at work, I follow the prescribed diet.	1	2	3	4	5
3. When participating in sports or recreational activities, I follow the prescribed diet.	1	2	3	4	5
4. When participating in social activities, I follow the prescribed diet.	1	2	3	4	5

## SECTION II--ACTION: LIMIT SMOKING AS SUGGESTED BY MY DOCTOR

	unlikely				likely
1. When at home, I limit smoking as suggested by my doctor.	1	2	3	4	5
2. When at work, I limit smoking as suggested by my doctor.	1	2	3	4	5
3. When I participate in sports or recreational activities, I limit smoking as suggested by my doctor.	1	2	3	4	5
4. When I participate in social activities, I limit smoking as suggested by my doctor.	1	2	3	4	5

## SECTION III--ACTION: FOLLOW THE ACTIVITIES PRESCRIBED BY MY DOCTOR

1. When at home, I follow the prescribed activity regimen.	1	2	3	4	5
2. When at work, I follow the prescribed activity regimen.	1	2	3	4	5
3. When participating in sports or recreational activities, I follow the prescribed activity regimen.	1	2	3	4	5
4. When participating in social activities I follow the prescribed activity regimen.	1	2	3	4	5

## SECTION IV--ACTION: TAKE MEDICATIONS AS PRESCRIBED BY MY DOCTOR

1. When at home, I take my prescribed medications.	1	2	3	4	5
2. When at work, I take my prescribed medications.	1	2	3	4	5
3. When participating in sports or recreational activities, I take my prescribed medications.	1	2	3	4	5
4. When participating in social activities, I take my prescribed medications.	1	2	3	4	5

## SECTION V--ACTION: MODIFY MY RESPONSES TO SITUATIONS THAT UPSET ME

1. When at home, I modify my responses to situations that upset me.	1	2	3	4	5
2. When at work, I modify my responses to situations that upset me.	1	2	3	4	5
3. When participating in sports or recreational activities, I modify my responses to situations that upset me.	1	2	3	4	5
4. When participating in social activities, I modify my responses to situations that upset me.	1	2	3	4	5

Appendix D  
Multidimensional Health Locus of Control Scale

Investigator: \_\_\_\_\_ Subject Code #: \_\_\_\_\_

**MHLC FORM A**

This is a questionnaire designed to determine the way in which different people view certain important health-related issues. Each item is a belief statement with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with the statement. The more strongly you agree with a statement, then the higher will be the number you circle. The more strongly you disagree with a statement, then the lower will be the number you circle. Please make sure that you answer every item and that you circle only one number per item. This is a measure of your personal beliefs; obviously there are no right or wrong answers.

Please answer these items carefully, but do not spend too much time on any one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

	strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree
1) If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2) No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3) Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4) Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5) Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6) I am in control of my health.	1	2	3	4	5	6
7) My family has a lot to do with my becoming sick or healthy.	1	2	3	4	5	6

	strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree
8)When I am sick, I am to blame.	1	2	3	4	5	6
9)Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10)Health professionals control my health.	1	2	3	4	5	6
11)My good health is largely a matter of good fortune.	1	2	3	4	5	6
12)The main thing which affects my health is what I do for myself.	1	2	3	4	5	6
13)If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14)When I recover from an illness, it is usually because other people have been taking good care of me.	1	2	3	4	5	6
15)No matter what I do, I am likely to get sick.	1	2	3	4	5	6
16)If it is meant to be, I will stay healthy.	1	2	3	4	5	6
17)If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18)Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

## Appendix E

### Assistant Investigator Agreement

I, \_\_\_\_\_, agree to serve as an assistant investigator for the research study entitled "Health value and health locus of control: impact upon compliance in cardiac patients" under the direction of L. Wightman, R.N. I realize my duties include orientation to the research project; identification of patients fitting inclusion criteria; obtaining consent from patients; and distribution and collection of questionnaires.

In addition to the above duties, I understand and agree to the following:

- patient care and teaching will not be neglected in order to collect data.
- patient responses to questionnaires and which patients participate is strictly confidential.
- non-work time will be utilized to identify patients and distribute questionnaires.
- participation in this study is strictly voluntary and has no bearing on my performance evaluation nor entitles me to "favours" or granted special privileges from L. Wightman.
- the consent form, demographic data form, HV survey, and the MHLIC scale constitutes one packet. I will be paid \$3.00 per completed packet.
- I will assist in the mail distribution of the HBS.
- I will receive lunch or dinner during orientation to the project and during preparation for mail distribution of the HBS.
- I realize I will be personally acknowledged and thanked in the final printed thesis.

Thank you for your interest in my project!

---

Appendix F  
Verbal Script

Hello Mr. \_\_\_\_\_.

My name is \_\_\_\_\_. I am a nurse at Blodgett Hospital. I am currently finishing my graduate degree in nursing at Grand Valley State University (or I am assisting a GVSU student with her research project for her graduate degree). I am interested in finding ways that nurses can be more helpful to people like yourself who are recovering from a heart attack and/or have had heart surgery. For this reason, I am conducting a study by asking people some questions about how they feel about their health and how they can manage things related to their health.

You have been selected for possible participation in this study because you are recovering from a heart attack and/or heart surgery. If you decide to participate, you will be asked to complete three short questionnaires -- two just prior to your discharge from the hospital and one 4 weeks after you are discharged to home. Each questionnaire takes a maximum of 15-20 minutes to complete.

Your participation in this study would be strictly voluntary. If you should decide to help out, you may withdraw at any time. Your decision to participate or not to participate will in no way have influence on the care you receive here. Should you decide to be involved, your answers will remain confidential. The results will be summarized, but there won't be identification of a specific answer with a specific individual.

It is not anticipated that this study will have any risk for you. Participation may not be of benefit to you directly, but the information you can share will be used in planning future programs to help the recovery of heart attack and heart surgery patients.

Do you have any questions? Would you be interested in participating?

If yes -- I would then obtain a written informed consent and give the individual the first two questionnaires.

If no -- I would thank them for their time and wish them well.

Appendix G

Informed Consent for Human Research Project

I, \_\_\_\_\_ agree to participate in a study under the supervision of Laura Wightman, RN. The purpose of this study is to improve patient education methods by attempting to provide support for the idea that education in cardiac rehabilitation programs should be individualized.

I understand that I will be asked to complete two questionnaires prior to discharge and one 4-6 weeks after discharge to home. Each questionnaire will take 15-20 minutes to complete. I understand that the questionnaire to be filled out after discharge will be mailed to my home with an addressed, stamped envelope for easy return. The questionnaires assess a personality characteristic, how I value health, and my health behaviors.

This study poses no personal risk or discomfort to myself. I realize that my participation may contribute new knowledge that may benefit future cardiac rehabilitation patients.

I understand that participation is voluntary. In addition, the care I receive from the nurses or physicians will not be affected if I choose not to participate. There will be no cost to myself or my insurance company. I understand that confidentiality will be protected. The results will be summarized, but there won't be identification of a specific answer with a specific individual. I can freely withdraw from participation in the investigation at any time.

I have read and fully understand the above information. Any questions I have about the research study will be answered by Laura Wightman (phone 878-1481). I will receive a copy of this signed consent form. I may also receive a summary of the results of the study if I choose.

Date: \_\_\_\_\_  
Subjects signature

Date: \_\_\_\_\_  
Witness signature



Appendix H  
Follow-Up Letter

Dear Sir,

I hope you are feeling well since your discharge from the hospital. Four weeks have passed since you initially consented to participate in the study. It is now time to complete the final questionnaire. Enclosed is a self-addressed and stamped envelope for convenient return of the questionnaire to me. Please return the questionnaire with every question completed the best you can. A large amount of time and effort went into preparing this study. The questionnaires must be returned in order to finish the study. Your time and effort is greatly appreciated. The results of this study will help patients like yourself in the future.

Instructions for completing the questionnaire are on the first page of the questionnaire. Please answer the questions as accurately as possible. Please complete every questions. If you have any questions, please feel free to call me collect at (616) 878-1481 anytime. I will look forward to your prompt response. Thank you!

Sincerely,

Laura Wightman, RN

**LIST OF REFERENCES**

## LIST OF REFERENCES

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