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The Relationship Between Health Locus of Control and Health Behaviors of Women Who Have Undergone Coronary Artery Bypass Grafting

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**THE RELATIONSHIP BETWEEN HEALTH LOCUS OF CONTROL AND HEALTH
BEHAVIORS OF WOMEN WHO HAVE UNDERGONE CORONARY ARTERY
BYPASS GRAFTING**

**Master's Thesis
Submitted to the Faculty
Sacred Heart University Nursing Program**

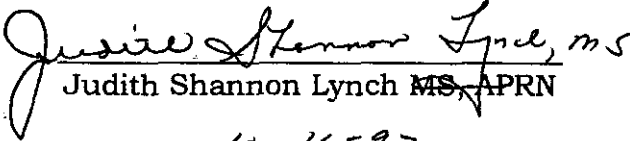
**In Partial Fulfillment
Of the requirements for the degree
Master of Science in Nursing**

Heather-Ann Ferrillo

December, 1997

Acceptance Page

This research report is in partial fulfillment of the requirements for the degree of **Master of Nursing**.



Judith Shannon Lynch MS, APRN

12-16-97

Date

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Heather-Ann Ferrillo

12-16-97
Date

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Abstract

THE RELATIONSHIP BETWEEN HEALTH LOCUS OF CONTROL AND HEALTH BEHAVIORS IN WOMEN WHO HAVE UNDERGONE CORONARY ARTERY BYPASS GRAFTING

Due to the increasing number of women who are diagnosed with heart disease and who are undergoing coronary artery bypass grafting, it is important to explore the psychosocial aspects involved in the recovery process of these women. This study examined the relationship between locus of control and health behaviors of women who underwent coronary artery bypass grafting. The study included 24 women who underwent surgery in a large urban hospital. Participants were sent a survey that assessed their locus of control and health behaviors one month following surgery. Results supported a positive relationship between internal locus of control and positive health behaviors in these women. The study showed that women who believed that their actions would yield favorable results were more likely to follow their medical regime. The study also supported the role of social support within this population. Results of the study are significant in helping nurses to motivate women to follow their medical regime following bypass surgery. It is also significant in reducing health care costs related to coronary artery disease as well as in shifting the focus of medicine from physician dominated encounters to a partnership between the patient and provider. Further research using a larger sample size as well as a longitudinal design would further assist in supporting the results of this study.

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Chapter I

Statement of the Problem

Coronary artery disease is a major health problem in the United States today. "About seven million Americans are affected by coronary artery disease and cardiovascular diseases still cause more deaths in the United States than all other diseases combined" (US Department of Health and Human Resources, 1992, p. 71). A goal for Healthy People 2000 is to reduce coronary heart disease deaths by 26 per cent (US Department of Health and Human Resources, 1992). Therefore health professionals need to explore coronary artery disease and the human response to it in order to achieve this goal. Reduction of known coronary risk factors including cigarette smoking, poor dietary habits, and lack of cardiovascular fitness, all contribute to the declining death rate due to coronary artery disease (Younger, Marsh & Grapp, 1995). According to a study by Sytkowski, D'Agostino, Belanger & Kannel (1996), changes in risk factors between 1950 and 1989 accounted for a 50 per cent or more decline in coronary mortality in women during that time. Therefore, by lowering the incidence of risk factors, we should be able to lower the death rate attributed to heart disease. In order to achieve this we need to look at etiologies of the risk factors that can eventually lead to death.

The literature has only recently evolved to include women as the sole subjects of research related to heart disease. The experiences of women with heart disease were considered significant only if they interfered with the traditional social roles of women; childbearing and homemaking (King & Paul, 1996). Even recently women have not been included in the large heart-related clinical trials (Sharpe, Clark & Janz, 1991). Research needs to be done on

women which includes the impact of the risk factors on gender. This is particularly important since women live longer, are more prone to chronic conditions and are more likely to be living alone. This means that successful self-management of heart disease is particularly important. It can affect a woman's level of functioning and her feelings of autonomy (Sharpe, Clark, & Janz, 1991).

Positive health behaviors include reducing risk factors that contribute to the incidence and progression of coronary artery disease. Cardiac rehabilitation programs are one way of achieving the goal of decreasing risk factors. This is done by helping the client adjust to his or her medical regime (Miller, McMahon, Ringel, Siniscalchi & Welsh, 1989). Despite the role of primary, secondary, and tertiary prevention (such as cardiac rehabilitation) in the reduction of risk factors, lack of adherence to prescribed regimens is in itself a major risk factor in behavior modification efforts (Fleury, 1991a).

Adherence to medical regimes was found to differ between men and women in only one behavior, exercise. Forty-one per cent of men versus 19 per cent of women reported following their exercise regime prescribed by their practitioner (Sharpe, Clarke, & Janz, 1991). The reason for this difference must be explored in order to increase the compliance of women.

Women were also found to "explore and create new patterns for living as a basis for the initiation of risk factor modification efforts" (Fleury, Kimbrell & Kruszewski, 1995). This notes a motivation in women for change. However, the basis for the motivation is unclear.

"Health locus of control is the individual's interpretation of the causality of behavioral outcomes related to health" (Redecker, 1989). It has been linked

to positive health behaviors mostly in areas other than heart disease (Duffy, 1988; Kist-Kline & Lipnickey, 1989). More specifically, research suggests that internal locus of control influences health orientation and the desire for physical well being. It also affects the compliance of patients to recommended health regimes (Hussey & Gilliland, 1989). Other studies have shown a similar link between internal locus of control and positive health behaviors. Though most were not related to coronary artery disease, (Marshall, 1991; Thomas, 1995; Tillotson & Smith, 1996; Wallhagen, Strawbridge, Kaplan & Cohen, 1994; Wassem, 1991; Zohar & Neuman, 1995), there are a few which tangentially addressed heart disease (Moser & Dracup, 1995; Younger, Marsh & Grap, 1995). One study of cardiovascular risk factor reduction showed a correlation between internal locus of control and positive health behaviors by supporting the relationship between lack of internal locus of control and a decrease in positive health behaviors (Biggs & Fleury, 1994). There are also studies in the literature which dispute this relationship (Bottorff, Johnson, Ratner & Hayduk, 1996; Redeker, 1988). The literature shows that there is stronger evidence to show that health locus of control, internal or external, is related to positive health behaviors.

There has also been evidence to link motivation with health beliefs (Fleury, 1991a). This study also encompassed empowerment which is a manifestation of internal locus of control. Still another study showed a relationship between motivation and health locus of control (Fleury, 1991b). However, locus of control has also been seen as a barrier to positive health behaviors (Robertson & Keller, 1992). The stronger correlations, however, have

shown positive relationships. Therefore we can assume a link among locus of control, health beliefs, motivation and empowerment.

An important point in researching locus of control is that it has mostly been studied without regard for situation-specific variables (Marshall, 1991). This may be one of the reasons for the lack of correlations seen in some of the research on locus of control and health behaviors, and a reason for studying a specific population and situation in regard to health locus of control and positive health behaviors. This study will attempt to link health locus of control with positive health behaviors in the context of coronary artery disease. More specifically, coronary artery disease will be manifested in the form of post-operative coronary artery bypass graft surgery.

Research Question

To what extent does health locus of control influence the positive health behaviors of women after coronary artery bypass grafting?

Hypothesis

There is a positive relationship between health locus of control and positive health behaviors of women after coronary artery bypass grafting.

Operational Definitions

Wellness motivation. Wellness motivation is the objective of an individual to begin and continue with a program of primary and secondary health promotion and illness prevention (Fleury, 1991a).

Health locus of control (HLOC). "Health locus of control is the individual's interpretation of the causality of behavioral outcomes related to health" (Redecker, 1989). Health locus of control can be either internal, external or a combination of both.

Internal locus of control (ILOC). Internal locus of control is the belief that individual behavior will influence outcomes (Younger, Marsh & Grapp, 1995). There are three dimensions of internal health locus of control: "recognition that illness prevention is contingent on the successful execution of potential health actions, recognition that illness management is contingent upon successful execution of potential health actions, and the perception of self-mastery over health outcomes" (Marshall, 1991).

External locus of control (ELOC). External locus of control is the belief that individual behaviors have little control over what happens to the individual. Outcomes are the direct result of external factors (Younger, Marsh & Grap, 1995).

Positive health behaviors. In the context of this study positive health behaviors will consist of modifiable risk factor reduction for coronary artery disease. These behaviors include, smoking cessation, dietary compliance, ideal body weight maintenance, and regular cardiovascular exercise (Sytkowski, D'Agostino, Belanger & Kannel, 1996).

Health protecting behavior. This type of behavior is described as prevention. The emphasis here is on guarding or defending either a group or individual against illness (Pender, 1987).

Health promoting behavior. This type of behavior is "directed toward maximizing positive arousal such as increased self awareness, self-satisfaction, enjoyment and pleasure" (Pender, 1987, p.59). Health promoting behaviors are usually lifestyle changes that require changing previous patterns of behavior (Pender, 1987).

Coronary artery bypass grafting (CABG). "A shunt, established surgically, that permits blood to travel from the aorta to a branch of the coronary artery past an obstruction" (Thomas, 1985, p. 384).

Multidimensional Health Locus of Control Scale (MHLCS). A tool used to determine whether a person is internally or externally motivated in regards to their health (Wallston, Stein & Smith, 1994).

Health Behavior Scale (HBS). A tool used to determine a cardiac patient's adherence to their medical regime (Miller, Johnson, Garrett, Wikoff, & McMahon, 1982).

Significance to Nursing

"The question for health care practitioners is how to motivate individuals to adopt and maintain a low-risk, heart healthy lifestyle" (Younger, Marsh, & Grap, 1995, p. 295). Motivation is important in assisting the client to begin and continue a cardiac rehabilitation program which is an important part of maintaining positive health behaviors in the patient who has undergone coronary artery bypass grafting (Fleury, 1991b). Both internal and external

locus of control are linked in the literature to the motivation of women to participate in positive health behaviors. This necessitates a shared responsibility between the patient and the health care practitioner (Fleury, 1991b). By seeing the importance of this responsibility, nurses can take into consideration whether a client is more internally or externally motivated when they assist clients in decision making regarding participation in such interventions as cardiac rehabilitation.

The role of the nurse practitioner is traditionally based on wellness and prevention (Hamric, 1996). The proposed research is also based on these factors. According to Brown (1996), the competency of advanced nursing practice has four characteristics. These include the use of the holistic perspective, partnerships with patients, expert clinical reasoning, and the use of diverse management approaches. This study is important in the assessment of cardiac patients regarding health promotion. It is important that health locus of control be evaluated in cardiac patients in order to assist patients in participating in health education/promotion programs (Kist-Kline & Lipnickey, 1989). By determining the factors that influence positive behaviors, such as internal versus external locus of control, nurses can develop effective health promotion programs (Bottorff, Johnson, Ratner & Hayduk, 1996).

An important role of the nurse practitioner is education, a function of nursing at all levels. According to Clark and Sprass (1996), education by advanced practice nurses is taken a step further. These authors call the education performed by advanced practice nurses "coaching through transition". The use of this phrase implies the existence of a relationship that fosters effective education. By determining the motivating factors for health

behaviors in the women included in this research, nurse practitioners can effectively build relationships and implement effective teaching strategies. In Chapter V, the role of the nurse practitioner will be explored further in regard to the results attained in this study.

It is also important that nurses acknowledge the individual motivational responses that influence positive health behaviors at different stages of recovery. This enables the development of those rehabilitative interventions that will increase patient motivation toward and participation in cardiovascular positive health behaviors (Fleury, Kimbrell & Kruszewski, 1995). By encouraging such behaviors, nurses can empower women to achieve their full health potential (Biggs & Fleury, 1994).

As stated previously, one goal of Healthy People 2000 is to reduce the incidence of coronary artery disease by 26 per cent. This can be accomplished with appropriate interventions to facilitate health promotion in these patients. By linking health locus of control and positive health behaviors, nurses can develop those interventions that patients are more likely to follow and thus help achieve this goal.

Chapter II

Introduction

This chapter will consist of two sections. The first part will present the theoretical framework used for this study, the Health Belief Model (HBM) (Rosenstock, Hockbaum & Kegeles, 1958). The model will be explained and studies that show its feasibility in practice will be introduced. The framework will then be applied to the population and circumstances being studied.

The second part of the chapter will consist of a literature review of the variables being examined in this study. Research studies both within the context of coronary artery disease and outside of this context will be reviewed due to the small amount of information linking the variables specifically to coronary artery disease. Initially the construct of health locus of control (HLOC) will be reviewed. This construct will be explored as a whole and separately as internal HLOC and external HLOC. Another variable explored will be positive health behaviors, which will be explored independently. Since wellness motivation is a strong theme in the literature when looking at locus of control and health behaviors, this concept will also be reviewed briefly along with its relationship to the variables of the study. Finally, research that depicts the relationship between the two variables of LOC and health behaviors will be reviewed. By completing this literature review a case will be made for the need for this research and the reader will understand the variables of the study and how they relate to the research question.

Theoretical Framework

As stated earlier, the framework that will be used in this paper is the Health Belief Model (HBM). Rosenstock, Hockbaum and Kegeles developed the HBM originally in 1958. The model was then refined and modified to the version now in use by Becker (Pender, 1987).

Since the subjects of this study are post coronary artery bypass grafting (CAGB), there is already a definitive diagnosis of heart disease. Therefore, positive health behaviors in this context are considered health-protecting or preventative behavior. This makes the HBM appropriate since it is a paradigm for health protecting or preventative behavior, but it is inappropriate for health-promoting behavior (Pender, 1987). The HBM is concerned with the perception of the individual of disease: therefore HBM concepts are well suited to explain and predict positive health behaviors in people who are diagnosed with coronary artery disease (CAD) (Fleury, 1992).

The HBM hypothesizes that behavior depends on two variables: the value of a particular outcome to an individual, and the individual's appraisal of whether the action will result in that outcome. It also assumes that prior to undertaking a particular action, the individual must have a psychological state of readiness to do so (Redecker, 1988). These concepts indicate the use of internal locus of control, which is the belief that individual behavior will influence outcomes (Younger, Marsh, & Grapp, 1995).

The variables which are part of the HBM are: perceived susceptibility to a disease, perceived severity of that disease, barriers and benefits to action, cues to action and general health motivation (Lauver, 1992). Since motivation will be linked in the literature review to HLOC, it can now be seen how locus of control

fits into this framework. According to research, it can also be seen as either a barrier or a benefit. Robertson and Keller (1992), found that barriers can include both external and internal factors such as personality characteristics (of which locus of control is one). Another study found that feelings of lack of internal locus of control occurred in response to social and environmental stimuli and led to a lapse in the process to change (Biggs & Fleury, 1994). Here locus of control is seen as a benefit since, without internal locus of control, the behavior modification process was slowed.

The variables of perceived susceptibility and severity are very important when examining the CAD population. Positive health behaviors that are needed and practiced post CABG surgery are based on the presence of a disease process. It is important that the individual sees the susceptibility and severity of CAD in order to motivate themselves to participate in risk reduction behaviors. This is a crucial component in facilitating change from a locus of control perspective.

Both parts must be present for the theory to be effective in motivation. Patients may feel highly susceptible to having a heart attack since they have CAD, but if they do not perceive the severity of a heart attack, then the probability of compliance with positive health behaviors is less (Hijeck, 1984).

The concept of motivation in relation to the HBM has been examined in several studies. Fishera and Frank (1994), looked at the use of the HBM in predicting mammography screening behavior. They found that health motivation was positively associated with compliance ($\beta = .163$). Again motivation is a manifestation of locus of control.

Benefits and barriers are the concepts under which most research is done in relation to the HBM. In a qualitative analysis by Biggs & Fluery (1994), cardiac rehabilitation patients were interviewed to determine barriers to positive health behaviors ($N=29$, women=11). The perceived barriers were affective response, physical response patterns, environmental factors, social relationships and resources. Internal locus of control was discussed related to the theme of affective responses. In a descriptive study by Hiatt, Hoenshell-Nelson and Zimmerman (1990), it was shown that patients who participated in cardiac rehabilitation perceived more benefits and fewer barriers to entering the program than those who did not. The sample size in this study was 39 patients (20 per cent were women).

Other research which linked a number of variables related to the HBM, looked at those variables explaining adherence to an exercise regime of patients who had undergone CABG or angioplasty ($N = 51$, women = 13) (Robertson & Keller, 1992). One result showed that individuals who perceived barriers to a recommended exercise regime had less compliance ($\beta = -0.368$, $p = 0.043$). Other results showed that respondents who thought that their disease was more serious and perceived greater benefits, also perceived fewer barriers.

The studies presented above in the context of the HBM show the feasibility of using the HBM when exploring the health behaviors of women post CABG surgery.

Review of the Literature

A major factor in the willingness or ability of a person to comply with prescribed medical treatments is the way a person perceives his ability to

control or change his life. This concept is known as locus of control, and it is a behavioral concept that reflects how a person perceives his ability to control his own life. Locus of control varies along a continuum from internal to external. Internally focused individuals believe that they control their own destiny while externally focused individuals believe that outside forces control their life (Hussey & Gilliland, 1989).

Kist-Kline & Lipnickey (1989), in a descriptive study, analyzed the literature present on HLOC. They investigated the age effects of HLOC and whether it varies throughout the lifespan. The study found HLOC might be affected by different variables, many of which are age related. The weakness of the document was that the conclusions were not based on research, but on an analysis of current literature. Another finding was that the assessment of HLOC should be multivariate. This is an important concept and is seen in other studies as an important concern.

Another study by Marshall (1991) assessed the hypothesis that internal control over health is composed of multiple dimensions. This study had an adequate sample size ($N = 181$). Forty-five percent of the respondents had heart problems, which makes this study relevant to the proposed research. Respondents were all male and mostly elderly. The researcher manipulated the tools that were used by developing his own questions and omitting some of the questions included in the tools. He did not assess the reliability or the validity of the scales. The analysis of the data was predominantly parametric. The results of the study, however, showed strong support for a multidimensional structure of internal control over health. This research is important to the current research because it shows the importance of including and analyzing

multiple dimensions of the variable of HLOC. Although the study has many drawbacks in its design, the results are important and are only used here to determine the design of the proposed study.

Internal locus of control has been shown to influence many factors in recovery. Psychosocial recovery from illness can have an effect on health behaviors. In 1995, Moser and Dracup attempted to determine the relationship between internal locus of control and psychosocial recovery from cardiac events. This was a longitudinal, comparative study. It also tried to determine whether there was a relationship between gender and LOC. All patients in the investigation had a myocardial infarction or coronary artery bypass grafting, making this study important for the current research. The sample size was large ($N = 176$). Both men and women were included (women = 25, men = 151), which makes results relevant to this research. The questionnaires were distributed at three and six months after the event. The study used tools that included the Control Attitudes Scale, the Psychosocial Adjustment Scale and the Multiple Affect Adjective Checklist. All were shown to be reliable and valid. The research was done using six different hospitals. The researchers used personal contact when collecting the data, which probably increased the sample size. Research data were analyzed using parametric methods (multivariate analysis and multiple regression analysis). Since locus of control was related to social support, the researchers controlled for this variable by ensuring that all respondents lived with a spouse or relative (this is a flaw as living with someone is not necessarily an indication of social support). The major finding of the study was that patients with higher internal control had better psychosocial recovery. This was assessed by anxiety, depression, hostility and psychosocial

adjustment to illness scores. Results also supported data that clinical and social demographic variables did not have an effect on recovery. There also was no sex related difference on the effect of internal locus of control on psychosocial recovery. Therefore, the results of this analysis can be applied to the current study.

A correlate of psychosocial recovery is the concept of illness related stress. Younger, Marsh and Grap (1995), found that internal locus of control related to mastery of illness related stress. This study also showed that internally oriented individuals made more attempts at controlling their environment. Although flawed, study results were supportive of the research question. The population consisted of cardiac patients ($N = 111$). Two thirds of the sample were males and only those who had a cardiac rehabilitation referral were chosen. A methodological flaw was the exclusion of patients who for one reason or another had cardiac disease but were not referred. Another methodological issue was that the sample was obtained by convenience sampling. The tools that were used were shown to be reliable and valid and parametric methods were used in data analyses. Results can be applied to the proposed study due to the relative reliability of the study.

As stated previously, HLOC exists on a continuum of internal to external. Few studies evaluate the effects of external locus of control independently. One investigation by Nir and Neuman (1995), evaluated the effects of both internal and external locus of control ($N = 66$). This study also looked at the role of self-esteem and internal-external locus of control as predictors of long term weight loss maintenance. Results showed that the higher the self-esteem score, the lower the average weight regain after a weight reduction program. It also

showed that those women who were more internally focused regained less weight initially than those who were externally controlled. However, after two years, there was no difference between those externally or internally motivated in the amount of weight regained. The research showed, however, that the internally motivated participants persevered longer. This study, though not done on cardiac patients, used women with a chronic and potentially life threatening condition (obesity). This study looked at only women, which is a strong point. It also used a longitudinal design and parametric data analysis. A flaw in the investigation was that they used a large age range. This study can be used to explain the effects of internal HLOC on women and their health behaviors.

Another study which examined both internal and external HLOC in the context of chronic illness, although not cardiac disease, was done by Wassem (1991). It looked at HLOC and how it relates to multiple sclerosis patients. This exploration showed that internally motivated people had more knowledge of their disease, practiced more self-care and had a more benign course of the disease than externally motivated people. The sample size ($N = 100$) was adequate and chosen randomly. Gender was not addressed in the study. It also inadvertently included social support since all the respondents were part of a multiple sclerosis support group (this was not addressed as a variable). The hypothesis was clear and was supported by a parametric analysis of the data (multiple regression). This study showed the difference between internally motivated and externally motivated patients in the presence of chronic disease.

Positive health behaviors are important to the treatment and reduction of chronic disease. Duffy (1988), looked at the health behaviors of mid-life

women, the predominant population that will be studied in the current research. The document showed that women are health conscious and they take an active interest in improving their health. The study, though based on the health promotion model, looked at 262 healthy women rather than those with a chronic disease state. The tools that were used were the Multidimensional HLOC Scale, the Rosenberg self-esteem Scale, the Health Perceptions Questionnaire, and the Health Promoting Lifestyle Profile. These tools were proven reliable and valid and the study used advanced parametric statistics (multiple regression). Weaknesses in this investigation were that it was performed on mostly highly educated women which left out the health promotion behaviors of poorer women. The women were also mostly white and working full-time, which again limits the results. However, the report can make a generalization about the health behaviors of women, which is an important variable in the present research.

Robertson and Keller (1992), examined the adherence to an exercise regime by 51 men and women. They used the HBM as a theoretical framework and looked at barriers to adherence. The barriers that were identified were shown to include both internal and external factors. The study found that those who perceived barriers had less adherence to the regimen. It also showed that those respondents who thought that their disease was more serious and who perceived more benefits, perceived less barriers. A flaw in this analysis was that it had multiple variables and a small sample size. It also looked at predominantly men (38) and evaluated only exercise as a behavior which could have introduced other extraneous variables. This study is important because

the population included is the same as the proposed research and it can give a general idea of adherence behaviors outside of the context of locus of control.

Motivation is also an important concept when looking at health behaviors and locus of control. A study done in 1991 by Fleury, was able to link motivation with locus of control and health behaviors. The study had a sample size of 52 and used three different institutions from which to draw the sample. According to the results, both internal and external HLOC showed significant correlations with wellness motivation. However, there was a dominant internal orientation related to wellness motivation. Externally, a belief in provider control over health outcomes was also correlated with wellness motivation. Finally, the investigation showed that as internal locus of control increased, motivation to initiate and sustain positive health behaviors increased. This study, although done predominantly on men and with a relatively small sample, linked three very important concepts to the current study.

A qualitative analysis by Fleury (1991), examined the relationship between wellness motivation and health behaviors. An important result of this study was that the concept of individual motivation as a process has implications in the initiation and maintenance of health behaviors. This information was gleaned from interviews with 29 subjects. The transcripts were reviewed line by line to determine common themes. The results showed that empowerment as manifested by wellness motivation explains the compliance with positive cardiovascular health behavior.

An important concept when looking at positive health behaviors is that of the health of the group being examined. In 1995, Thomas examined a variety of psychosocial variables in middle-age adult women. One of these variables was

internal locus of control. The analysis was done using secondary data that were collected in 1986 by Barnish and Barnet. Since the data were nine years old and not collected by the current researchers, the reliability of the data and their collection are questionable. The original method of collection however was described in detail in the article. The sample size was adequate (238) and home interviews were used to collect data. The sample was drawn from census lists in order to look at a representative population. While the study looked at women, most of the women were those with high prestige jobs. Therefore the results can not be applied to poorer women. Parametric statistics (multiple regression) were used for data analyses and the interpretation of the results was adequate. There were many conclusions from the study but the most relevant was that the healthiest women scored higher on locus of control than those were less healthy ($F = 6.34, p = .0001$).

Multiple studies have been done that link HLOC with health behaviors. Some show a correlation between the general construct of HLOC and health behaviors, while some link the more specific area of internal locus of control with health behaviors. Few actually look at this in the context of heart disease.

The effect of internal HLOC on older men and women was explored by Wallhagen, Strawbridge, Kaplan & Cohen in 1994. Although this study included men, it analyzed data in a comparative method to differentiate between the patterns seen in men ($N = 147$) versus women ($N = 209$). The study was longitudinal and the population was assessed at baseline and then again six years later. The final sample size was 356 patients and an interviewing technique was used for data collection. A drawback to the study was that only two questions were used from the health locus of control study. However, the

questions that were used were chosen by the author of the tool so as not to change the reliability or validity of results. Parametric statistical methods were used in data analysis. One of the extraneous variables that probably could not be controlled for was the fact that the functioning scores for the women were lower as a whole at baseline than those of the men. Therefore, the differences in health status may have had an effect on results. This study showed that the importance of good health was strongly correlated with internal locus of control for men. Women showed a similar link but to less an extent. A strong direct effect of internal locus of control was found on the health promoting behaviors of women. However, a relationship was not supported. In both men and women, when illness was a factor, a change in eating patterns was associated with high levels of internal locus of control. This supports a relationship between internal locus of control and positive health behaviors in the context of a disease state.

Links between individual perceptions of HLOC and self-esteem, as well as how health status influences positive health behaviors, was explained by Duffy (1988). The study looked at mid-life women and was not in the context of a disease state. The study also showed that women did not want to leave their health to chance, especially if their previous health status was not perceived as "good". This study was reviewed previously in this chapter.

As stated previously, social support as a manifestation of reinforcement, is essential to locus of control. In 1996, Tillotson and Smith examined locus of control, social support and the adherence to treatment regimes by diabetics. Although not associated with heart disease, this study looked at locus of control in the context of a chronic disease. The sample was large (465) and data were

collected using structured interviews. The major drawback of the study was that participants were asked to self-report their adherence to regimes. This may have skewed data since respondents may have over reported adherence. Positive aspects were that the study contained more women ($N = 384$) than men ($N = 136$) and the sample was a population sample versus a convenience sample. The demographics of the participants were highly characteristic of the population with diabetes in the United States. Data were also analyzed using parametric techniques. Results of the investigation showed that locus of control and social support were statistically significant and were moderate predictors of adherence to the regimes.

A large percentage of the respondents perceived themselves to have high levels of internal locus of control, social support and adherence to positive health behaviors. The study can be applied to the current study proposal since cardiac disease, like diabetes, is a chronic condition requiring life style changes.

One study that examined cardiovascular risk reduction was found to correlate locus of control with positive health behaviors. The actual purpose of the investigation done by Biggs & Fleury (1994), was to identify the role of perceived barriers to cardiovascular risk reduction in influencing individuals to change their health behavior. While examining this, researchers found that lack of internal LOC led to a decline in the behavioral change of the respondents. The study looked at 29 participants through structured interviews. The analysis was qualitative and used common themes that were found to explain results. Researchers did not disclose their sample selection method and whether the sample was reflective of the population. The sample size was large for a qualitative study and consisted of close to 50 per cent

women ($N = 11$). The findings were also discussed with knowledgeable peers to ensure trustworthiness of the data. This study is instrumental in showing a link in cardiac disease between locus of control and positive health behaviors and paves the way for further exploration.

Finally, one study did not support a relationship between internal locus of control and health behaviors. This study, by Bottorff, Johnson, Ratner & Hayduk (1996), examined whether perceived health control, perceived self-efficacy and perceived health status contributed to health promoting behaviors. The study was nationwide and used a secondary data source. The sample size was 1339 and consisted only of women. The age range was vast and consisted of participants between the ages of 20 to 64 years. The study was also done on healthy people and according to the health belief model, there must be a threat of illness. Basically, the study showed that the cognitive-perceptual factors that were examined contributed little to the health promoting behaviors of women.

The above chapter examined the use of the HBM in looking at health locus of control and positive health behaviors. Since the HBM is based on preventative behavior, studies that were presented in the context of this model were able to be tied into the current research. Most of the studies dealing with the HBM dealt with chronic disease, not specifically with cardiac disease. The research reviewed in this chapter showed many gaps in the literature that will be examined. Most studies dealt with at least a partial sample of men, and many that included women had a low percentage of women as participants. Those studies that looked at women exclusively did not deal with cardiac disease. The investigations that included women usually did not look at the differences between the men and women, but lumped them together. Other

gaps included the examination of the role of health locus of control in chronic disease but not specifically in those patients who have undergone coronary artery bypass grafting. Most studies also looked at one aspect of locus of control and did not include the multidimensionality of this concept.

The gaps present in the literature relating to health locus of control and positive health behaviors serve as basis for the design of the current study.

Chapter III

Introduction

The following chapter will describe the methods that were used in carrying out this research study. It will include the design of the study, a description of the sample, the setting, instruments used, limitations of the study, procedures for data collection, and methods used for the data analysis.

Design of the Study

The study presented here is a nonexperimental, correlational study that evaluated the relationship between Locus of Control, internal and/or external, and the health behaviors of women who have undergone coronary artery bypass grafting (CABG). Participants in the study received a self-administered packet, which included three questionnaires 30 days following surgery. These questionnaires were The Health Behavior Scale (Miller, Johnson, Garrett, Wikoff, & McMahon, 1982), the Multidimensional Health-Locus of Control Scale (Wallston, Wallston, & DeVellis, 1978), and a demographic questionnaire. The demographic questionnaire always appeared last in order to maximize interest in the study (Polit and Hungler, 1995). The remaining two questionnaires were in random order in order to achieve counterbalancing (Polit and Hungler, 1995). Pearson Correlations were used to test the research hypothesis. Ancillary analysis was performed using certain data by way of T-tests and/or Analysis of Variance. This will be explained in detail in the data analysis section.

Sample

The target population for this study included women who have undergone coronary artery bypass grafting. The accessible population was women who have undergone coronary artery bypass grafting in one large urban hospital in New England.

The population chosen had specific eligibility requirements, two of which were gender and age; women over the age of 50 years. This age group was chosen because, according to Fleury, Kimbrell, & Kruszewski (1995), coronary artery disease is the leading cause of death and disability in American women over age 50 years. Another eligibility requirement was that all of the women must have had CABG surgery for the first time. This helped to keep the group homogeneous. Another means for maintaining homogeneity was a post-operative stay in the hospital of 15 days or less. This helped to decrease any effects of severe complications on the outcomes. Another delimitation of the sample was that the participants must have been living in the community at the time of questioning. This helped to decrease the effect of institutional requirements that may have affected outcomes.

The sample was chosen via convenience sampling at a large urban hospital in New England. Potential participants were approached for participation while recovering from CABG surgery in the institution. Informed consent, along with the participant's address, were obtained at that time. Participants were mailed the questionnaires approximately 30 days following surgery. In order to be part of the study, the questionnaires must have been completed between 30 and 75 days following surgery. The questionnaires were numbered and the date that the participant had surgery recorded to ensure

completion within the proper time period. Participants were recruited until usable data were received from 24 participants. This allowed for a usable sample size of more than 20 participants per independent variable (Polit & Hungler, 1995).

The sample consisted of a diverse range of socioeconomic classes. This was assumed since CABG surgery in the area is only performed in large urban hospitals, causing patients to present from diverse areas around the state. This factor assisted in drawing a representative sample from the entire population.

Setting

As stated previously, the participants were recruited following surgery from a large urban hospital in New England. The completion of the questionnaire took place at the participant's residence since the packets were mailed. This helped to decrease the level of anxiety due to completion of the forms since they were in familiar surroundings and able complete them at their convenience.

Instruments

The first instrument used in this study was the Multidimensional Health Locus of Control Scale (MHLCS) - Form C (Appendix A). Wallston, Wallston, & DeVillis developed this instrument in 1978 in two parallel forms (A and B). Form C was developed in 1994 (Wallston, Stein, & Smith), and contains similar questions that are condition specific. Form C was used in this study due to better reliabilities. The MHLCS contained 18 questions from three subscales. The three subscales were: internality, powerful others externality and chance

externality. Questions from the three subscales were distributed randomly throughout the instrument. The answers to the questions were placed on a six point Likert scale which ranged from strongly agree (1) to strongly disagree (6). The possible range of scores for each subscale was 6 through 36.

Reliability coefficients for the entire scale as well as each individual subscale were acceptable with ranges from $r = .70$ to $.87$ (Wallston, Stein, & Smith, 1994). Construct validity was shown by changes in scores in a group of patients with chronic pain undergoing pain management interventions designed to decrease feelings of helplessness (Wallston, Stein, & Smith, 1994). Concurrent validity was also shown by modest correlations with subscales of form B of the MHLCS (Wallston, Stein, & Smith, 1994).

The second instrument used was the Health Behavior Scale (Appendix B) (Miller, Johnson, Garrett, Wikoff, & McMahon, 1982). This scale is a 20 question, 5 point Likert scale that measures cardiac patients adherence to their medical regime. The scale was adapted from the Health Intention Scale to reflect the measurement of the participant's actual, rather than intended, behavior. The instrument consisted of five subscales that evaluated the following behaviors: diet, smoking, activity, stress and medications. Each subscale had two parts that were scored separately. The first part evaluated what the person actually performed and the second part evaluated the perceived beliefs of others. This can link the concept of social support.

Alpha reliabilities for the subscales 30 days to 60 days post cardiac event ranged from $r = .82$ to $.92$ (Miller, Wikoff, McMahon, Garrett & Ringel, 1988). Content validity was not changed from the Health Intention Scale since the wording was only changed. The Health Intention Scale was assessed for

content validity by experts from several disciplines (Miller, Johnson, Garrett, Wikoff, & McMahon, 1982).

Permission to replicate and use both of the above tools was obtained from the authors of the respective tools (Appendices C & D).

The final questionnaire included in the packet was a demographic questionnaire (Appendix E) that included information such as age, socioeconomic status, ethnic background, complications after discharge, participation in cardiac rehabilitation, and presence of support network. This information was used for inclusion criteria for the study as well as to perform ancillary data analysis.

Limitations

There were several extraneous variables present in the design of this study. Several of these could not be controlled and may have influenced the participant's answers. These include the participant's values of health, knowledge, and self-esteem. However, there are several that could be accounted for or controlled for. The first was attendance at cardiac rehabilitation. Not all patients attend cardiac rehabilitation, but some do and this may have impacted their answers since they may have been more knowledgeable and/or motivated. Although this variable could not be controlled, it was taken into account. The demographic questionnaire addressed whether the participant attended rehabilitation and ancillary data analysis was performed. Having a tight inclusionary criterion controlled for disease. As stated previously, the participant must have had CABG surgery for

the first time without major complications. This helped to keep the extraneous variables related to Disease State at a minimum.

There were some threats to internal validity within the study which could be controlled. The first was the importance of questionnaire completion within 30 to 75 days of surgery. To ensure this, the researcher numbered all packets and kept track of when each participant had surgery. The researcher also included a statement of the importance of expediency within the cover letter (Appendix F). Any questionnaire not completed during the time line explained was not considered in the data analysis. As stated previously, in order to control for validity within the questionnaire itself, the instruments were in random order and the demographic sheet was last. This researcher made all contact with the participants and each participant received the same information both upon consenting to participate and in the questionnaire packet. Since the behaviors were self reported there was also the possibility that information was not completely accurate. This could not be controlled. There was also the possibility of assistance from others with the completion of the packet. The importance of independent completion was stressed in the cover letter.

There were few threats to external validity in this study. One threat was that since the study contained all women the results could not be generalized to men. However, the study could be replicated easily in a large urban hospital since most heart surgeries are done in these types of institutions. As stated previously, the participants were from diverse backgrounds due to the few hospitals that perform this surgery and the necessity of patients to come from outlying communities. This information was assessed in the demographic

questionnaire. Ancillary analysis was completed by looking at socioeconomic status.

Procedures

Upon approval by the university's Internal Review Board, as well as the institution's review board, the researcher began recruiting participants for the study. The list of patients moved from the ICU to the step-down unit was reviewed daily for female patients over the age of 50 years. The patients were approached and the study described as well as the inclusionary criteria explained. Each patient received the same explanation which included; a statement about purpose, importance of the study, time it would take to participate, confidentiality, and ability to withdraw at any time. If the patient was interested in participating, she was assessed for proper inclusionary criteria. Written consent (Appendix G) for the study was obtained from the participant along with the address to which to send the packet. Approximately 30 days after surgery, the participant was mailed a packet containing the three questionnaires described previously, as well as a cover letter reviewing the study and instructions for participation. The packet also included a stamped, addressed envelope for the participant to return the questionnaires to the researcher. One week after the packet was mailed, a reminder post-card was mailed to all participants. Upon receiving the completed forms, the researcher reviewed the questionnaires for completeness and proper inclusionary criteria for the study. Those that were not complete or did not meet the criteria were not used for data analysis. This process continued until a sample size of 24

was attained. The entire process kept the participants' identities and answers completely anonymous.

Data Analyses

The data obtained were analyzed in several ways. First the hypothesis was tested using Pearson Product Moment Correlations to determine a relationship between Locus of Control and health behaviors. Ancillary analyses were also performed on the results of the above plus several demographic data. Ancillary analyses were performed using Analysis of Variance and/or T-tests to look at attendance at cardiac rehabilitation, socioeconomic status, presence of support within the household and age.

Summary

Methods described in this chapter were used to carry out a nonexperimental, correlational study that involved women who underwent coronary artery bypass grafting. By using the methods described, the study attempted to determine a relationship between health locus of control and the health behaviors of these women.

Chapter IV

Introduction

The chapter that follows will discuss the data and results of the study that was described in chapter III. The initial section will describe the characteristics of the sample. The chapter will then review the scoring of the tools and the results of this as well as the distribution of the scores. The data analysis section will begin with a testing of the hypothesis using Pearson Product Moment Correlation. Also included in this section is an ancillary analysis of data obtained from the demographic questionnaire. Social support, age, attendance at cardiac rehabilitation and socioeconomic status were analyzed using Analysis of Variance. Two other Pearson Product Moment Correlations were also performed comparing health behavior of the participant with perceived beliefs of others and locus of control with the perceived beliefs of others.

Description of the Sample

As stated in the previous chapter, the initial sample size was 40 women. This is the number of women who agreed to participate in the study. Twenty-six surveys were received, 24 of which were useable. One of the discarded surveys did not have the Health Behavior Scale completed while the other one arrived past the deadline for returns. This gave the researcher a workable sample size of 24. The mean age of the sample was 69.9 years of age, with a range of 54 to 83 years of age. All respondents were Caucasian.

The marital status and living arrangements, which were used as an aspect of social support, are described in Tables 1 and 2 respectively. Most of the respondents were married (50%), while a substantial number were also widowed or divorced. Comparative with the marital status distribution is the distribution of the living arrangements. Most respondents lived with a spouse (45.8%), however, a large percentage of those remaining (29.2%) lived alone. However, of those who lived alone, all were able to identify at least one person that was a source of support for them. Six of those living alone noted a family member as their source of support and one noted a friend. Twelve respondents were with a spouse while only 11 were married (this difference is probably due to the fact that the spouse is living in an extended care facility).

Table 1

Distribution of Marital Status

Value Label	Frequency	Percent	Valid Percent	Cum Percent
Single	1	4.2	4.2	4.2
Married	12	50.0	50.0	54.2
Divorced	4	16.7	16.7	70.8
Widowed	7	29.2	29.2	100.0
Total	24	100.0	100.0	

Table 2

Distribution of Living Arrangements

Value Label	Frequency	Percent	Valid Percent	Cum Percent
Spouse	11	45.8	45.8	45.8
Children	4	16.7	16.7	62.5
Other family	1	4.2	4.2	66.7
Alone	7	29.2	29.2	95.8
Other	1	4.2	4.2	100.0
Total	24	100.0	100.0	

Socioeconomic status was determined by average household income. The frequency distribution of total household income is reported in Table 3. The majority of the respondents reported a household income of under \$20,000 per year (41.7%). The other respondents were distributed among the other four categories.

Linked somewhat to socioeconomic status was educational level (Table 4). The two highest responses were completion of high school (37.5%), and some college (25%). The rest of the responses were distributed among no attendance at high school (8.3%), some high school (12.5%), and completed college (12.5%).

The final descriptive statistic was whether respondents had attended cardiac rehabilitation. The majority (58.3%), did not attend cardiac

Table 3

Distribution of Total Household Income

Value Label	Frequency	Percent	Valid Percent	Cum Percent
Under 20k	10	41.7	47.6	47.6
20k to 29k	2	8.3	9.5	57.1
30k to 39k	5	20.8	23.8	81.0
40k to 49k	1	4.2	4.8	85.7
50k to 59k	3	12.5	14.3	100.0
Total	24	100.0	100.0	

Table 4

Distribution of Educational Status

Value Label	Frequency	Percent	Valid Percent	Cum Percent
Did not attend HS	2	8.3	8.7	8.7
Some HS	3	12.5	13.0	21.7
Completed HS	9	37.5	39.1	60.9
Some college	6	25.0	26.1	87.0
Completed college	3	12.5	13.0	100.0
Missing	1	4.2	Missing	
Total	24	100.0	100.0	

rehabilitation, 29.2% were attending cardiac rehabilitation at the time of response, and 12.5% did not answer the question. This descriptive was important to note so that an ancillary analysis could be performed looking at attendance at cardiac rehabilitation and its possible effects on the two variables being studied. The analysis of this data is described later in this chapter.

The above section described the sample that was studied along with describing variables that will be used for ancillary analysis later in this chapter.

Results of Surveys

One of the tools used was the Multidimensional Health Locus of Control Scale (MHLCS) - Form C (Appendix A). This scale was based on a six-point Likert scale and asked the respondents to answer questions that determined the extent to which participants exhibited internal and external motivation. The scale was broken up into subscales: internal, chance, and powerful others. Powerful others was further broken into two subscales: doctors and other people. Each subscale consisted of a number of questions and adding the answers from the questions included in the subscale tabulated the scores. Missing answers in this scale would have affected the scores and probably skew data. All missing answers were replaced with a calculated score. This was done by calculating the mean score of the items in the subscale that were not missing and dividing by the number of items in the subscale. This method was suggested by the author of the tool (Wallston, 1993). Surveys with missing data were minimal.

The internal, chance, and powerful other subscales had a possible range of 6 to 36. The doctor and other people subscales had a possible range of 3 to

18. The actual ranges differed somewhat from the possible ranges (see Table 5). The highest mean score belonged to the powerful others subscale ($M = 26.43$, $SD = 5.80$). Of the two subscales within this subscale, the score for doctors was significantly higher (16.46%) than the other people (9.88%). These results show that the sample studied has characteristics of all types of locus of control, but more characteristics of motivation by powerful others in their lives. This will be discussed further in the next chapter.

Table 5

Mean Scores of Multidimensional Health Locus of Control Scale

Variable	<u>M</u>	<u>SD</u>	Range	Minimum	Maximum	<u>n</u>
Internal	24.26	6.72	26.00	10.00	36.00	24
Chance	17.43	8.75	26.00	6.00	32.00	24
Powerful Others	26.43	5.80	20.00	16.00	36.00	24
Other People	9.88	4.76	15.00	3.00	18.00	24
Doctor	16.46	2.00	6.00	12.00	18.00	24

Another tool used in this study was the Health Behavior Scale (HBS) (Appendix B). This scale was based on a five-point Likert scale that asked respondents to rate how well they followed their health regime in the areas of diet, activity, smoking, medications and stress. The questionnaire looked at the respondents' actions at home, work, in social situations and during recreational activities. It was not essential that all questions be answered since some may

not be applicable. To score this tool, the mean was computed for answers that were given. The mean was calculated for the entire scale, as well as for each subscale. The mean of the sample for behavior in general and for each subscale is reported in Table 6. The overall compliance was high ($M = 4.58$, $SD = .44$). Looking at the subscales the researcher can hypothesize the importance of each subscale to the majority of the women. Medication compliance was the highest ($M = 4.97$, $SD = .16$), while diet compliance was the lowest ($M = 4.33$, $SD = .72$). The small sample size in the smoking subscale could mean several things: they never smoked, they stopped smoking, or they did not want to answer that question.

Table 6
Mean Scores of the Health Behavior Scale

Variable	<u>M</u>	<u>SD</u>	Range	Minimum	Maximum	<u>n</u>
Behavior	4.58	.44	1.70	3.30	5.00	24
Diet	4.33	.72	2.50	2.50	5.00	23
Medication	4.97	.16	.75	4.25	5.00	22
Smoking	4.71	.74	2.25	2.75	5.00	9
Stress	4.45	.74	2.00	3.00	5.00	23
Activity	4.50	.75	3.00	2.00	5.00	24

The second part of this tool had the respondents answer the same questions only looking at how significant others would expect them to behave.

This part of the tool was helpful to link social support with health behaviors. This section was scored by computing the mean of the entire scale, as well as the mean of each individual subscale. The results of this analysis is reported in Table 7. The average mean was higher than the actual behaviors reported in the first section ($M = 4.79$, $SD = .28$). Smoking was the highest score among the subscales ($M = 5.0$, $SD = .00$), while stress was the lowest score ($M = 4.61$, $SD = .89$). Although the importance of the subscales differed somewhat between the participant and the perceived belief of others, these results are significant since they lend support to the idea that social support has an impact on health behaviors. Statistical analysis using Pearson Product Moment Correlation is shown later in this chapter.

Table 7
Mean Scores of Perceived Beliefs of Others Scale

Variable	M	SD	Range	Minimum	Maximum	N
PBO Behavior	4.79	.28	1.00	4.00	5.00	24
PBO Diet	4.76	.42	1.00	4.00	5.00	23
PBO Medication	4.96	.21	1.00	4.00	5.00	23
PBO Smoking	5.00	.00	.00	5.00	5.00	8
PBO Stress	4.61	.89	4.00	1.00	5.00	23
PBO Activity	4.75	.53	2.00	3.00	5.00	24

Testing of the Hypothesis

As stated in chapter I, the study hypothesis looked at whether there is a positive correlation between locus of control, internal and/or external, and the health behaviors of women following coronary artery bypass grafting.

To test this hypothesis, a Pearson Product Moment Correlation was performed the results of the two tools presented above. The results of this analysis are of presented in Table 8. This table shows that behavior as a whole was significantly correlated with internal locus of control ($r(22) = .41, p < .05$). This two-tailed correlation shows a positive relationship between the two variables. Other dimensions of locus of control were not shown to have statistically significant correlations with behavior. A Pearson Correlation was also performed looking as each dimension of locus of control with each of the behavior subscales. This analysis did not show a statistically significant correlation between locus of control and any one of the behavior subscales.

Other Findings

An analysis was performed on the independent and dependent variables in conjunction with some of the descriptive variables. The most important ancillary analysis was the relation among social support and the two variables. Since there is no tool that measured social support, there were several ways in which data were analyzed to determine the role of social support. First a Pearson Correlation was performed using the results of Part A and Part B of the Health Behavior Scale. Data in Table 9 show that there is a significant positive relationship between the actual behavior and the expected behavior by the

Table 8

Pearson Correlation of Behavior and Health Locus of Control

	Behavior	Internal	Powothers	Chance	Doctor	Othpeople
Behavior	1.0000	.4118	-.0162	-.0583	.1021	.0016
		P= .046	P= .940	P= .787	P= .635	P= .994
Diet		.3435	-.1345	-.0069	-.0495	.0820
		P= .109	P= .541	P=.975	P=.823	P=.710
Medication		.3424	.2475	.3001	.2138	.3180
		P= .119	P= .267	P= .175	P= .339	P= .149
Smoking		.3648	.3172	.4252	.2332	.4200
		P= .334	P= .406	P= .254	P= .546	P= .260
Stress		.3673	.0330	-.2696	.2423	-.0775
		P= .085	P= .881	P= .213	P= .265	P= .725
Activity		.3407	.0501	.0546	.1694	.0631
		P= .103	P= .816	P= .800	P= .429	P= .770

Table 9

Pearson Correlation of Health Behaviors and Perceived Beliefs of Others

	Behavior	PBO
Behavior	1.0000	.4560 P= .025
PBO	.4560 P= .025	1.0000

family as perceived by the participant ($r(22) = .46, p < .05$). However, this does not signify a direct correlation between health behaviors and social support, only of the two variables tested. Further analysis is needed to determine this relationship and this will be discussed further in chapter V.

Another Pearson Correlation was performed using the results of Part B of the Health Behavior Scale and the results of the MHLCS. Table 10 depicts these results. This table shows a statistically significant positive correlation between internal locus of control and the expected behavior by the family as perceived by the participant ($r(22) = .66, p < .001$). This relationship further lends support to the role of social support in this study.

Another important ancillary variable was the participation in cardiac rehabilitation. To determine a difference in behavior scores between those who attended rehabilitation and those who did not, a t-Test was performed. The results did not show a statistically significant difference between those who

Table 10

Pearson Correlation of Locus of Control and Perceived Belief of Others

	PBO	Internal	Chance	Powerothers	Doctors	Otherpeople
PBO	1.000	.6582	.1233	.1807	.2312	.1532
		P = .000	P = .566	P = .398	P = .277	P = .475

attended and those who did not ($t(19) = .873, p = .210$).

An Analysis of Variance was performed on the scores of the internal subscale with total household income and living arrangements. The results showed no statistically significant difference among the groups in either analysis, total household income ($F(4,18) = .32, p = .86$) or living arrangements ($F(2,17) = .30, p = .75$).

An Analysis of Variance was also performed on the scores of the entire behavior scale with total household income and living arrangements. These results also showed no significant difference among the groups in either analysis, total household income ($F(4, .07) = .24, p = .91$) or living arrangements ($F(2, .13) = .42, p = .67$).

Finally, an Analysis of Variance was performed on the subscales of internal, powerful others and the entire scale of behavior with age. The results of all of these analysis showed no significant difference between the dependent variables and age ($F(3,39) = .82, p = .50$), ($F(3,22) = .61, p = .61$), ($F(3,24) = 1.30, p = .30$) respectively.

Summary

This chapter reported the results of the statistical analyses performed on data obtained from this study. The most significant finding was a positive correlation between internal locus of control and health behaviors. This finding supported the hypothesis of the study. Other significant findings included a relationship between perceived beliefs of others and internal locus of control as well as a relationship between perceived beliefs of others and health behaviors. The meaning of these results will be further explored in the next chapter.

Chapter V

Summary

As previously stated, the purpose of this study was to determine if there was a relationship between health locus of control, internal and/or external, and the health behaviors of women who have undergone coronary artery bypass grafting. The sample was drawn from women recovering from surgery at a large urban hospital. Forty subjects consented to participate and the final sample size was 24 women. The participants completed surveys that were sent to their homes 30 days following their surgery. These surveys used reliable and valid tools to measure health locus of control and health behavior. Using the data obtained from the study, a statistical analysis was performed which supported the stated hypothesis. A positive relationship was found to exist between internal locus of control and health behavior in this population. This result was expected due to similar results found in other studies using these two variables. Other significant findings were stated in Chapter IV. This chapter will discuss and analyze the findings of the study, relating the results to previous studies on the same subjects. It will also analyze the limits of the study and discuss areas for further research in this area.

Discussion

Health locus of control. The tool used to evaluate this variable was the Multidimensional Health Locus of Control Scale (MHLCS). This scale focused on the multidimensionality of Health Locus of control. As previously stated, it was divided into subscales of internal, chance, and powerful others. The author of this scale feels that locus of control occurs on a continuum, and that

individuals cannot be neatly placed into one category or the other. Individuals have characteristics of all three, although one may dominate more than the others (Walston, 1993). Therefore, scores obtained from this tool on the subscales cannot be used to label the participants as internal or external, but they can be used to determine which dimension of locus of control influences their health to a greater extent.

Study results showed that the mean score of powerful others exceeded the mean score of the other two subscales. This indicates that the population studied has somewhat more characteristics of external locus of control than internal locus of control. When the powerful others subscale was further divided into doctors and other people, doctors had a significantly higher mean score than other people. With the population studied, this can possibly be attributed to the fact that these patients were just completing the physical recovery phase from the surgery. Therefore, they may feel that their doctor still plays a large role in their lives.

Moser and Dracup (1995), studied patients who had had a myocardial infarction (MI) or had undergone bypass surgery three and six months after the event. They found that patients with higher internal scores had better psychosocial recovery from the event. This study is helpful to understanding current results since, at the point the above patients were studied, they had already completely recovered physically from the event. At the time of the study they were in the psychological recovery phase. This indicates that locus of control can change as priorities and foci in an individual's life change. Had the current study included an assessment at three and six months, it may have found scores of the MHLCS to be different.

A study done by Thomas (1995), looked at a variety of psychosocial variables in middle-aged women. One of these variables was internal locus of control. An important finding of the study was that the healthiest women of the group scored higher on locus of control than those who were less healthy. Therefore, locus of control scores obtained in the current study should not be generalized to women as a whole since the study by Thomas showed a difference in scores between healthy and unhealthy women, and the current study dealt only with unhealthy women.

Health behavior. The tool used to evaluate the health behaviors of women in the study was the Health Behavior Scale (HBS). This tool was divided into five subscales: diet, medication, smoking, stress and activity. A second section of the tool looked at the participants' perceived beliefs of others of their behavior. This section did not directly assess the variable of health behavior and will be explained further when social support is discussed.

The mean score of the total scale was 4.58, with a range of 3.30 to 5.00. This showed that all participants were likely to follow their medical regime. The highest subscale score was with medications, in which the mean score was 4.97, with a range of 4.25 to 5.00. Diet was the lowest subscale score with a mean of 4.33, with a range of 2.50 to 5.00. The smoking subscale was difficult to interpret. Some participants left that section blank. This could indicate several things: they never smoked, they stopped smoking, or they did not want to answer that question. Many participants reported compliance in this area, which may mean that they quit smoking or they never smoked to begin with. Two of the respondents reported some degree of noncompliance with smoking. This accounts for the range of 2.75 to 5.00. The results of this tool tell a great

deal about the studied population. Most of the sample felt that medication was more important than diet to their recovery, at least at this stage. Since most people were not smoking it could mean either that the event had made them aware of the dangers of smoking or that other factors were affecting smoking behaviors. This may be due to the initial scare factor that eventually will wear off or to an actual understanding of the need to cease smoking. Further assessment of participants at a later date would help to determine which of these is most likely.

High scores on this subscale are consistent with the findings of Duffy (1988). This study looked at the determinants of health promotion in midlife women. The author found that women are generally health conscious and actively take part in health promotion. This research can be applied to the current study, although the mean age in the study was 45.5 and the mean age of the current study was 69.9 years. However, by using the results of the two studies, the results can be generalized to a broader age group. Duffy's study also looked at healthy women. Although the results of the HBS alone cannot be generalized to healthy women, the results of Duffy's study can support a possible generalization to women in general.

Another study by Robertson and Keller (1992), looked at individuals who underwent bypass surgery or angioplasty to determine variables that explained adherence to a prescribed exercise regime. A relevant result of this study was that those participants, who perceived their disease to be more serious, perceived more benefits and fewer barriers to the activity plan. This was not addressed in the current study. Those women who were more compliant with

their regime may have perceived their condition to be more serious than those who were not as compliant. This finding is speculative.

Support of the hypothesis. The hypothesis tested in this study was that there is a positive correlation between health locus of control, internal and/or external, and the health behaviors of women who have undergone coronary artery bypass grafting. As previously reviewed, there have been several studies looking at the relationship between these two variables. Some explained locus of control as a whole and some looked only at subscales of locus of control. Most did not look at cardiac disease and none looked at the exact population addressed in the current study.

The results of the Pearson Product Moment Correlation performed to test the hypothesis showed a positive correlation between health behavior and internal locus of control. This correlation ($r(22) = .41, p = .05$), was low but statistically significant. Biggs and Fleury (1994) looked at perceived barriers to cardiovascular risk reduction. They found that perceived lack of control led to a lapse in the change process. These results are similar to the current research in that internal locus of control was found to influence health behavior. The Biggs and Fleury study used both females and males in the sample. Therefore, only female subjects' data can be correlated with the current results. Since the study dealt with cardiac disease, however, it is applicable to current results.

The results of the Pearson Product Moment Correlation also showed that there was no significant relationship between external locus of control subscales and health behaviors. These results are contrary to a study done by Fleury (1991B). Fleury's study showed a positive relationship between internal locus of control and wellness motivation, which has been linked previously to

health behaviors. However, it also showed a degree of externality related to motivation in the sample. This analysis shows the multidimensionality of health locus of control while the current study was unable to show a correlation among all dimensions.

In a related study, the same author (Fleury, 1991B), looked at the relationship between individual motivation and health behaviors. This study also used participants with cardiac disease, which makes it relevant to the current research. This study found that individual motivation has implications for the initiation and maintenance of cardiac health behavior. This can be related to the results of the current study and can assist in building support for the hypothesis.

Finally, as previously stated in Chapter II, there was one study that did not support the relationship between locus of control and health behaviors in women (Bottorff, Johnson, Ratner & Hayduk, 1996). These results are contrary to the results of the current study but the methods were also different. Their analysis used a relatively younger sample that was healthy. The element of chronic disease could not be accounted for. Therefore due to this study, generalization of the results of the current study to healthy women of all ages is not possible.

As stated in Chapter IV, the Pearson Correlation did not show a significant relationship between the subscales of the health behavior scale and any dimension of locus of control. This shows that, although behavior as a whole is related to internal locus of control, individual subscales are not significantly related. Since the relationship between internal locus of control and health behaviors was small, although statistically significant, it is difficult

to determine if one of these subscales is the reason for the relationship.

Therefore, it cannot be speculated which behavior is most affected by internal locus of control. These results may have been different if the sample size were larger; since this may have made the relationship more significant and it may have been possible to factor out which behaviors were more significant.

Other findings. Social support, as stated previously, is a related concept to locus of control. An aspect of social support, perceived beliefs of others, is assessed through Part B of the HBS. This scale asked the same questions as Part A, but evaluated the participants' perceived beliefs of others rather than the actual behavior. As a whole, the perceived belief of how others thought they should behave ($\underline{M} = 4.79$, $\underline{SD} = .28$) was greater than the actual behavior ($\underline{M} = 4.58$, $\underline{SD} = .44$). This difference shows that participants know how they are expected to act by others, but their behavior is not consistent with this awareness. According to the subscales, participants perceived others to believe that not smoking was the most important behavior ($\underline{M} = 5.00$, $\underline{SD} = .00$), and stress reduction was the least ($\underline{M} = 4.61$, $\underline{SD} = .89$). Since the sample size of those who answered the smoking questions was significantly smaller than the entire sample, these results may not accurately reflect the behavior and beliefs of the entire sample. This may also be due to the fact that not smoking is a behavior that is tangible and able to be observed easily by others, while stress reduction is more difficult to evaluate.

As reported in Chapter IV, another significant finding related to social support was the relationship between actual behavior of the participants and the expected behavior by the family as perceived by the participant ($r(22) = .46$, $p < .05$). As stated previously, this does not correlate social support directly

with health behaviors but the relationship can be indirectly implied from the above relationship. Miller, Wikoff, Garrett, McMahon & Smith performed a similar investigation in 1990. That study looked at MI patients two years after the event. It showed that the perceived belief of others, as measured by the same scale as the current study, predicted compliance in each of the subscales of the HBS. The results here indicate the need for further studies using these variables and will be discussed later in this chapter.

Another significant result was the relationship between the perceived beliefs of others and internal locus of control ($r(22) = .66, p < .001$). This shows a moderate relationship between the variables. Social support, as a manifestation of reinforcement, seems essential to locus of control. Reinforcement is represented by the perceived beliefs of others. Therefore the results of this correlation can link social support with internal locus of control. A study by Tillotson and Smith (1996), showed that locus of control and social support were significant and predictors of adherence to regime. This study, along with the results of the current study, can assist us in linking locus of control, social support and health behaviors.

As the results from the previous chapter show, other ancillary analyses were not significant. One of these analyses dealt with cardiac rehabilitation. A significant difference in behavior was not found for those who attended cardiac rehabilitation. This may be due to the sample amount of participants who attended. These results do not support a negative relationship but only confirm the fact that more research with a larger sample size needs to be done.

Analysis of variance was performed using demographic data such as household income, living arrangements and age. Again these results were not

significant. This does not mean that there is not a difference in health behaviors and/or locus of control within the groups studied but only that results could not be considered significant due to the high chance of being due solely to chance. Further research with a larger sample may provide different and possibly significant results.

Limitations of the Study

Even though this study had statistically significant results, there were limitations. There were several extraneous variables that could not be controlled. These included the participants' value of health, knowledge and self-esteem. Cardiac rehabilitation was taken into consideration, and since the analysis performed on this data was not statistically significant, it is not as strong an extraneous variable. All threats to internal validity were controlled as stated in Chapter III.

One of the largest limitations was sample size. Even though the sample size was adequate, a larger sample size may have shown more significant results and may have shown some expected results as well. Examples are those relationships between behavior and other dimensions of locus of control and the role of cardiac rehabilitation.

Another limitation was the fact that participants were only assessed one to two months following surgery. As stated previously, they were just moving out of the recovery phase and this may have affected some of their responses. Responses may have been different if the population was studied six months to one year after surgery.

This study cannot be generalized to women as a whole due to studies cited above. However, the researcher believes that it can be generalized to women who have had the same type of surgery within the same time frame in this area of the country. It can also be potentially generalized to women within the same age group with a chronic disease other than coronary artery disease.

Wallhagen, Strawbridge, Kaplan & Cohen (1994), looked at the impact of internal locus of control on health outcomes in older men and women. They found many gender differences in the outcomes of their study. One significant difference was that internal locus of control decreased with age in women, but increased with age in men. It is therefore impossible to generalize the results of the current study to men.

Recommendations for Research

There are several areas that will benefit from further research related to this study. The first area is the time frame. As stated previously in this chapter, results were limited by the close proximity of data collection to the cardiac event. Further research should include assessment of the same variables in the same type of population as the current study six months to one year following surgery. In fact, surveys at 30 to 60 days and at six months to two years would provide interesting data for an evaluation of how locus of control and health behaviors change over time. A study that was done on women who participated in a weight reduction program (Nir & Neumann, 1995) gives further support to this idea. This study found that, although initially there was a difference in the weight loss of those who were internally versus externally motivated, within two years there was not a significant difference.

One study in the literature by Marshall (1991), looked at the multidimensionality of internal locus control. This is not prominent in the literature. Since a relationship between internal locus of control and health behaviors was seen in the current study, it would be interesting to evaluate the multidimensionality of that relationship.

Another interesting area for further research is the role of the physician in influencing health behaviors. This study only touched on this issue in its finding that “powerful others” locus of control was a significant force for these women, especially the control of the physician. Although this analysis did not show a significant correlation between “powerful others” locus of control and health behaviors, further research with a larger sample may change results. It would also be important to see at what point following surgery the influence of the physician dissipated. Research in this area will provide further insight into the role of external locus of control in the lives of women following surgery.

Since ancillary analysis revealed a relationship among internal locus of control, health beliefs of others and perceived beliefs of others, this is also further ground for research. More studies could be done on the same population using perceived belief of others as a variable. An exploration into the meaning of this variable and how it can be applied to the population would be appropriate in such a study.

The above discussion is not exhaustive but merely presents the types of studies that may support results obtained here.

Implications for Practice

The results of this study have implications for the nurse practitioner, for nursing, and for the health care delivery system as a whole. In Chapter I, the expected significance to nursing was reviewed. Also the role of the nurse practitioner was explored. The following section will discuss these implications as they relate to results of the study.

The most significant result of the study was the relationship between internal locus of control and positive health behaviors. Although the sample consisted of women undergoing heart surgery, this relationship has been previously supported in other populations. These findings show that if a woman believes that her actions will cause positive results, it is more likely that she will follow her medical regime. Therefore, positive outcomes will result. These findings are consistent with the Health Belief Model which states the importance of benefits and barriers in influencing health behaviors. These benefits and barriers can assist women in determining their beliefs in a certain behavior or treatment. If a woman perceives more benefits than barriers it fosters more of a belief in the efficacy of treatment. One role of the nurse, therefore, is to assist women in finding more benefits than barriers to treatment to encourage internal aspects of locus of control.

For example, a woman with heart disease and multiple cardiac risk factors will comply with her regime if she believes in its positive results it will have. This belief may be influenced by past experiences or observed experiences of others of the efficacy of the behavior. She may see the results that medication has on her blood pressure and therefore she perceives a benefit to this treatment. She will then continue to take her medication because she

believes it will control her hypertension. The opposite also holds true. If the same woman has seen her husband follow a strict low cholesterol diet without a decrease in his cholesterol level, she will not see the benefit of dietary compliance. She will then not be likely to follow her own dietary restrictions. Thus, past experiences and observations of others' behaviors help to determine whether a woman believes in the effectiveness of her own positive health behaviors.

As stated in Chapter I, the concept of education as it relates to nurse practitioners is called "coaching through transition" (Clark & Sprass, 1996). This concept can be used with results of this study. Women who have heart disease need to make a transition in order to recover from the event as well as modify their lifestyle. According to Fleury, Kimbrell, & Kruszewski (1995), women who experienced a cardiac event described the process of healing as a pattern that evolved over time. It included a struggle through the uncertainty surrounding the event and the discovery of ways to create positive health behaviors. Nurse practitioners can be instrumental in a successful transition by providing education, counseling and support to these women. Since results of the study support the fact that internal motivation is related to modification of risk factors, nurse practitioners' efforts are not in vain with this population. Efforts should be made to encourage women, even those who are not internally motivated, to participate in health promotion activities in hopes that they will develop characteristics of internal motivation by results of these activities.

Part of the role of the nurse practitioner is the development of partnerships with patients (Brown, 1996). Locus of control is multidimensional and exists on a continuum. Although this study did not support the role of

external locus of control in predicting positive health behaviors, it has been supported in previous research. The partnership between nurse practitioner and patient is the epitome of the multidimensionality of locus of control. Partnership in practice between the nurse practitioner and the patient can influence the recovery of women with cardiac events. Since internal locus of control is correlated with positive health behaviors, it is important to educate women to understand the efficacy of risk factor control in preventing cardiac events. Education will only be successful if the woman believes in what the nurse practitioner is advocating. The nurse practitioner can foster internal locus of control characteristics in the patient while exerting some influence to the powerful other characteristics of the patient.

Related to the partnership between provider and patient is the role of the significant other in health protection. This study showed a correlation between the perceived beliefs of others and health behavior, as well as between perceived beliefs of others and internal locus of control. From these results it can be speculated that the way women perceive others to want them to behave affects whether they are internally motivated, thus leading to positive health behaviors. For example, if a woman with heart disease perceives that her husband feels that her diet and activity are important in lowering her risk for a cardiac event, she may see this as a benefit. She will then be motivated to follow her regime. Therefore, nurses should encourage the role of significant others in the lives of women with chronic diseases.

Results from the HBS show the difference in importance of several areas of compliance to this population. This aspect of the study is applicable to all nurses. For example, most participants were more compliant with medication

than with diet. This can mean either that women feel that medication is more important than diet or that medication is an easier regime. This information is important for nurses to know so that educational strategies may focus on areas that need more work. Because every woman may not agree with the importance of each subscale it is important for nurses to assess the importance to the individual of each area prior to implementing a teaching plan.

Implications for the Health Care Delivery System

The health care delivery system can benefit from this research in several ways. Since the study showed that women who are internally motivated take better care of themselves, savings of health care dollars can result. Since risk factor reduction is the most important aspect of preventing cardiac events, women who are motivated to follow their regime should have less chance of having a repeat event. This is a tremendous savings for managed care and the health care system in general.

The results of this study have further implications for the health care system. Results can be instrumental in changing the focus of traditional medicine. The partnership aspect of health protection and promotion previously explored gives patients and their families a voice in their care. This moves the focus of medicine from a patriarchal system where the doctor dictates treatment, to a shared responsibility between the provider and client. This is a large step for the health care system, but one that should have favorable outcomes as long as providers continue to encourage a partnership role.

Conclusion

Much literature has focused on locus of control and health behaviors independently, but only a limited amount tie the two variables together. This study looked at these two important variables in a population of women who underwent CABG surgery. Results that showed a positive correlation between internal locus of control and health behaviors were consistent with the literature. Clearly stated, women who believe that their actions will have positive outcomes will exhibit more health protecting behaviors. Since it is known that risk factor reduction decreases the incidence of cardiac events, positive health behaviors by these women should lead to a decreased cardiac risk overall. The role of social support in the form of perceived beliefs of others was also explored and found to have a role in health behaviors of these women. This study adds further support to the importance of locus of control when trying to predict health behaviors in a population of females undergoing CABG. There are implications for advanced practice as well as nursing research and the health care delivery system. Further research as reviewed above will only serve to strengthen and expand upon results obtained.

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Appendix A
Form C

Instructions: Each item below is a belief statement about *your medical condition* 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 that statement. The more you agree with a statement, then the higher will be the number you circle. The more 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.

- | | |
|------------------------------|---------------------------|
| 1 = STRONGLY DISAGREE (SD) | 4 = SLIGHTLY AGREE (A) |
| 2 = MODERATELY DISAGREE (MD) | 5 = MODERATELY AGREE (MA) |
| 3 = SLIGHTLY DISAGREE (D) | 6 = STRONGLY AGREE (SA) |

	SD	MD	D	A	MA	SA
1. If my <i>condition</i> worsens, it is my own behavior which determines how soon I feel better again.	1	2	3	4	5	6
2. As to my <i>condition</i> , what will be will be.	1	2	3	4	5	6
3. If I see my doctor regularly, I am less likely to have problems with my <i>condition</i> .	1	2	3	4	5	6
4. Most things that affect my <i>condition</i> happen to me by chance.	1	2	3	4	5	6
5. Whenever my <i>condition</i> worsens, I should consult a medically trained professional.	1	2	3	4	5	6
6. I am directly responsible for my <i>condition</i> getting better or worse.	1	2	3	4	5	6
7. Other people play a big role in whether my <i>condition</i> improves, stays the same, or gets worse.	1	2	3	4	5	6
8. Whatever goes wrong with my <i>condition</i> is my own fault.	1	2	3	4	5	6
9. Luck plays a big part in determining how my <i>condition</i> improves.	1	2	3	4	5	6
10. In order for my <i>condition</i> to improve, it is up to other people to see that the right things happen.	1	2	3	4	5	6
11. Whatever improvement occurs with my <i>condition</i> is largely a matter of good fortune.	1	2	3	4	5	6
12. The main thing which affects my <i>condition</i> is what I myself do.	1	2	3	4	5	6
13. I deserve the credit when my <i>condition</i> improves and the blame when it gets worse.	1	2	3	4	5	6
14. Following doctor's orders to the letter is the best way to keep my <i>condition</i> from getting any worse.	1	2	3	4	5	6
15. If my <i>condition</i> worsens, it's a matter of fate.	1	2	3	4	5	6
16. If I am lucky, my <i>condition</i> will get better.	1	2	3	4	5	6
17. If my <i>condition</i> takes a turn for the worse, it is because I have not been taking proper care of myself.	1	2	3	4	5	6
18. The type of help I receive from other people determines how soon my <i>condition</i> improves.	1	2	3	4	5	6

Appendix B
Health Behavior Scale *

Patients with Heart Conditions

Investigator _____

Subject Code Number _____

Date _____

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 section has two parts: Part A which includes statements of carrying out the action in different environments; Part B which includes statements about other people's thoughts toward carrying out the action in different environments.

In Parts A and B each statement has five spaces for indicating the extent you believe you carried out the actions during the past year at home, at work, and while participating in sports or recreational activities and social activities. The rating scale for indicating this ranges from 1 to 5 with number 1 indicating you are fairly sure you are not performing the action to number 5 indicating you are fairly sure 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.

unlikely

likely

Example:

1 2 3 4 5

If I become very ill, I will
go to the hospital.

	X			
--	---	--	--	--

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SECTION I - ACTION: FOLLOW THE DIET PRESCRIBED BY MY DOCTOR (INCLUDING ALCOHOL)

Part A.	Unlikely			Likely	
	1	2	3	4	5
1. When at home, I follow the prescribed diet.					
2. When at work, I follow the prescribed diet.					
3. When participating in sports or recreational activities, I follow the prescribed diet.					
4. When participating in social activities, I follow the prescribed diet.					

Part B.	Unlikely			Likely	
	1	2	3	4	5
5. Most people who are important to me think I should follow the prescribed diet at home.					
6. Most people who are important to me think I should follow the prescribed diet at work.					
7. Most people who are important to me think I should follow the prescribed diet while participating in sports or activities.					
8. Most people who are important to me think I should follow my prescribed diet while participating in social activities.					

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

Unlikely

Likely

Part A.

1 2 3 4 5

1. When at home, I limit smoking as suggested by my doctor.

2. When at work, I limit smoking as suggested by my doctor.

3. When I participate in sports, or recreational activities, I limit smoking as suggested by my doctor.

4. When I participate in social activities, I limit smoking as suggested by my doctor.

Unlikely

Likely

Part B.

1 2 3 4 5

5. Most people who are important to me think I should limit smoking at home.

6. Most people who are important to me think I should limit smoking at work.

7. Most people who are important to me think I should limit smoking while participating in sports or recreational activities.

8. Most people who are important to me think I should limit smoking while participating in social activities.

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

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

Part B.	Unlikely			Likely	
	1	2	3	4	5
5. Most people who are important to me think I should follow my prescribed activity regimen at home.					
6. Most people who are important to me think I should follow my prescribed activity regimen at work.					
7. Most people important to me think I should follow my prescribed activity regimen while participating in sports or recreational activities.					
8. Most people who are important to me think I should follow my prescribed activity regimen while participating in social activities.					

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

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

	Unlikely			Likely	
Part B.	1	2	3	4	5
5. Most people who are important to me think I should take my prescribed medications at home.					
6. Most people who are important to me think I should take my prescribed medications at work.					
7. Most people who are important to me think I should take my prescribed medications while participating in sports or recreational activities.					
8. Most people who are important to me think I should take my prescribed medications while participating in social activities.					

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

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

	Unlikely		Likely		
Part B.	1	2	3	4	5
5. Most people who are important to me think I should modify my responses to situations that upset me at home.					
6. Most people who are important to me think I should modify my responses to situations that upset me at work.					
7. Most people who are important to me think I should modify my responses to situations that upset me while participating in sports or recreational activities.					
8. Most people who are important to me think I should modify my responses to situations that upset me while participating in social activities.					

Thank you for helping us with this research project.

Vanderbilt University Medical Center

School of Nursing
 Health Care Research Project
 Contact Phone: (615) 322-2520
 Email: WALLSTKA@CTRVAX.VANDERBILT.EDU

Godchaux Hall
 Nashville, TN 37240-0008
 Telephone (615) 322-4400
 FAX (615) 343-7711

To: Fellow Health Researcher

From: Kenneth A. Wallston, Ph.D. *KAW*

Re: The Multidimensional Health Locus of Control (MHLC) Scales

Thank you for your recent inquiry about our MHLC scales. Enclosed you will find copies of all three forms of the MHLC (Forms A, B, & C) along with scoring instructions for the forms.

Forms A & B are the "general" health locus of control scales that have been in use since the mid-late 1970's (and were first described in Wallston, Wallston, & DeVellis, 1978, Health Education Monographs, 6, 160-170.) Each of these two "equivalent" forms contain three 6 item subscales: internality; powerful others externality; and chance externality. In the past 15+ years, forms A/B have been used in nearly a thousand studies and have been cited in the literature hundreds of times.

Form C is a relatively new version of the scale that we first started to develop in 1987. Form C is designed to be "condition-specific" and can be used in place of Form A/B when studying people with an existing health/medical condition. [The way you make this happen is to replace the word "condition" in each item with whatever condition (e.g., arthritis, diabetes, pain, etc.) your subjects have.] Form C has not yet been published, but sufficient work has been done with it that we are confident it is in its final usable form. Like Forms A/B, Form C also has 18 items, but, instead of a single 6 item powerful others subscale, Form C has two, independent 3 item subscales: doctors, and other people.

We consider all three forms of the MHLC to be "in the public domain." That means that you are free to use the scales in your research (and to alter them for your research in any way you choose) without obtaining our explicit permission. We do ask, however, that you cite the scales correctly if/when you use them¹. If you profit monetarily from the use of our scales, we expect that a suitable contribution would be made to "The Vanderbilt Health Care Research Project." If you are a student, you have our permission to include a copy of our scale(s) in the appendix to your thesis or dissertation; otherwise, it would be unethical to publish these scales without obtaining our explicit written permission to do so.

I have recently written and copyrighted a manual for the use of the MHLC scales. It is not necessary for you to purchase a copy of this manual in order to use the scales, but, if you would like to purchase a copy, please send a check for \$10.00 (US) made out to "Vanderbilt University" to: Health Care Research Project; School of Nursing; Vanderbilt University Medical Center; Nashville, TN 37240.

¹ If you need/want to cite Form C, you may use the following citation:

Wallston, K.A., Stein, M.J., & Smith, C.A. (1993). Form C of the MHLC Scales: A condition-specific health locus of control scale. Unpublished manuscript. Vanderbilt University. Nashville, TN.

February 13, 1997

Heather Terrillo
369 Strong Town Rd
South Berry CT

Dear Heather:

Enclosed is the Health Behavior Scale for patients with heart conditions that you requested. I'm also sending an explanation of the Scale and the latest reliabilities for intentions and adherence. My only requirement is that you reference their use appropriately.

Best wishes for your research.

Sincerely,

A handwritten signature in cursive script that reads "Sister Patricia Miller".

Sister Patricia Miller, Ph.D., R.N.
Professor and Chairperson
Department of Nursing

SPM/mn
Enclosures

DEMOGRAPHIC QUESTIONNAIRE

THIS INFORMATION CANNOT BE USED TO IDENTIFY YOU PERSONALLY AND IT WILL BE USED FOR STATISTICAL PURPOSES ONLY

Q-1. Age: _____

Q-2. Occupation: _____

Q-3. Marital status:

1. SINGLE
2. MARRIED
3. DIVORCED
4. WIDOWED

Q-4. Date of Surgery: _____

Q-5. With whom do you live?

1. SPOUSE
2. CHILDREN
3. SIGNIFICANT OTHER
4. OTHER FAMILY (SPECIFY) _____
5. FRIEND
- 6.. ALONE

Q-6. Ethnic background:

1. CAUCASIAN
2. NATIVE-AMERICAN
3. ASIAN-AMERICAN
4. HISPANIC
5. AFRICAN-AMERICAN
6. OTHER (SPECIFY) _____

Q-7. Level of education:

1. DID NOT ATTEND HIGH SCHOOL
2. SOME HIGH SCHOOL
3. COMPLETED HIGH SCHOOL
4. SOME COLLEGE
5. COMPLETED COLLEGE
6. SOME GRADUATE SCHOOL
7. COMPLETED GRADUATE SCHOOL
8. TECHNICAL/TRADE SCHOOL

Q-8. Total household income:

1. UNDER \$20,000
2. BETWEEN \$20,000 AND \$29,000
3. BETWEEN \$30,000 AND \$39,000
4. BETWEEN \$40,000 AND \$49,000
5. BETWEEN \$50,000 AND \$59,000
6. GREATER THAN \$60,000

Q-9. Do you have a history of any of the following?

1. HIGH BLOOD PRESSURE
2. HEART ATTACK
3. STROKE
4. CANCER
5. RESPIRATORY PROBLEMS
6. DIABETES
7. SMOKING

Q-10. Did you have any of the following complications following surgery?

1. WOUND INFECTION
2. RESPIRATORY INFECTION
3. IRREGULAR HEARTBEATS
4. ANGINA
5. OTHER (SPECIFY)_____

Q-11. Do you or have you attended cardiac rehabilitation since discharge?

1. YES, I DO NOW
2. YES, BUT I DO NOT ATTEND NOW
3. NO

12. Who is the person that gives you the most emotional support and what is their relation to you?_____

September 29, 1997

Dear Participant:

Thank you for participating in this research study. As explained before, this study is looking at women who have had bypass surgery. Enclosed you will find three questionnaires. Please take a few moments to complete these and return them in the stamped and addressed envelope. It is important to the study that you complete these as soon as possible. Please do not put your name on the questionnaires. All information will be anonymous. If possible, try to complete the questionnaires without the help of friends or family.

Remember there are no right or wrong answers. Some of the questions refer to your "condition". The "condition" is heart disease. If you have any questions please feel free to contact me. Thank you again for your participation in this study.

Sincerely,

Heather-Ann Ferrillo RN-BSN

(203) 264-3562

INFORMED CONSENT FORM

INTRODUCTION: My name is Heather Ferrillo and I am a Registered Nurse on Verdi 5 East at the Hospital of St. Raphael. I am a graduate student at Sacred Heart University pursuing my Master's Degree in Nursing. As part of the requirements for graduation I must complete a research thesis.

INVITATION TO PARTICIPATE: This is an invitation for you to participate in a research study involving women and heart disease.

SUBJECT SELECTION: You have been selected to participate in the study because you are a woman who has recently had bypass surgery. To participate in the study you must be at least 50 years old and have had no previous bypass surgery. The study will include forty women.

PURPOSE OF THE STUDY: The purpose of the study is to look at the health behaviors of women following bypass surgery. The study will look at whether women are motivated internally or by outside influences to comply with their medical plan.

EXPLANATION OF PROCEDURE: If you decide to participate in the study, it will involve filling out a survey that will be mailed to your home in about four weeks. You will be asked to complete the survey and return it in the stamped and addressed envelope enclosed. It will take about 15 minutes to complete. This will be the end of your participation in the study.

RISKS AND BENEFITS: There will be no risks nor benefits involved in participating in the study.

ASSURANCE OF CONFIDENTIALITY: Any personal information obtained in this study will be kept confidential and destroyed after the study is complete. All surveys will be kept anonymous and will not include identifiable information. There will be no way to link the names of the subjects with the answers to the surveys. The packet that you will receive will be numbered. These numbers will not be linked to your name, only to your day of surgery.

FINANCIAL OBLIGATION: There will be no cost nor economic gain to you by participating in the study.

SUBJECT WITHDRAWAL: Participation is voluntary. Your decision whether or not to participate will not affect your present or future care at the Hospital of St. Raphael. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time.

OFFER TO ANSWER QUESTIONS: If at anytime you have questions or concerns regarding the study, feel free to contact the investigator.

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ THE INFORMATION PROVIDED ABOVE. YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP.

SIGNATURE OF THE SUBJECT

DATE

SIGNATURE OF INVESTIGATOR

DATE

INVESTIGATOR:
HEATHER-ANN FERRILLO RN BSN
(203) 789 - 3162