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**Instrument development to assess knowledge of lifestyle change**

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**The University of Arizona, 1987**

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INSTRUMENT DEVELOPMENT TO ASSESS KNOWLEDGE  
OF LIFESTYLE CHANGE

by

Amelia Steinbinder

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A Thesis Submitted to the Faculty of the  
COLLEGE OF NURSING  
In Partial Fulfillment of the Requirements  
For the Degree of  
MASTER OF SCIENCE  
In the Graduate College  
THE UNIVERSITY OF ARIZONA

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Associate Professor of Nursing

4/14/87  
Date

DEDICATION

In loving memory of Eric who will never have the opportunity to begin what I had the good fortune to complete.

#### ACKNOWLEDGEMENTS

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## ABSTRACT

This study involved designing an instrument to estimate self care knowledge levels of post myocardial infarction patients. The instrument subscales -- diet, smoking, exercise, signs and symptoms of cardiac distress, medications, stress and high blood pressure -- were chosen based on information cardiac patients and dietitians identified as being important for self care, American Heart Association guidelines and a panel of cardiac experts.

Twenty-six subjects were tested following hospital discharge and again two weeks later. Test-retest reliability was performed to establish stability of the instrument using Phi Correlation Coefficients. The preset criterion level of .70 for the total scale was not met. The medication subscale did meet the .70 criterion level.

Reliability estimates were conducted to establish internal consistency of the instrument. Alpha coefficients were used. The preset criterion level of .70 was not met for the total scale; however, the stress subscale did meet the .70 criterion level on the retest.

Concurrent validity was estimated by comparing subscale knowledge scores with self report behavior. Point biserial coefficients did not meet the preset .70 criterion levels.

These results suggest that reliability and validity estimates in the post myocardial infarction patient population were not statistically significant. The small sample, the homogeneity of the group who participated in a cardiac rehabilitation program and the high initial and subsequent test scores which indicated a high level of knowledge may have affected the results.

## CHAPTER 1

### STATEMENT OF THE PROBLEM

After a myocardial infarction (MI), information regarding recommended lifestyle changes is necessary to reduce the likelihood of further myocardial insult. Lifestyle changes - dietary restrictions, smoking cessation, blood pressure control, stress reduction and exercise - may be equated with self care. Levin defined self care as "a process whereby a lay person can function effectively on his own behalf in health promotion and prevention and in disease detection and treatment at the level of the primary health resource in the health care system" (1977, p. 1).

Self care must be emphasized if health care professionals expect individuals to be responsible for their own health. In addition, nurses need to be able to assess patients' self care knowledge levels to provide educational plans. However, instruments available today do not adequately measure self care knowledge. For example, questions regarding emergency treatments such as use of monitoring equipment and oxygen therapy were included in one published test (Rahe, Scalzi & Shine, 1975). Knowledge of emergency treatments may not aid individuals in caring for themselves at home. Also, knowing the rationale for the use of the heart monitor or nasal oxygen in the coronary care unit may not effect the necessary lifestyle changes an individual must make.

Another published test (Johnson, Cantwell & Fletcher, 1976) included dietary vocabulary that may be confusing for the lay population. For example, one item asked for the best description of cholesterol. The item does not directly reflect an individual's ability to identify an acceptable dietary choice. A third published knowledge test (Owens, McCann & Hutelmyer, 1978) included items concerning knowledge of cardiac anatomy and physiology. Such information may be of interest, but it does not indicate the individual's knowledge of self care activities.

Patient's perceptions of self care needs obtained by interviews may provide valuable information for instrument content. None of the authors of published instruments interviewed cardiac patients prior to instrument construction. Secondly, reliability and validity estimates have not been published for any of the instruments. As a result an appropriate instrument for estimating patient knowledge is unavailable. Thus, the problem addressed in the present study was the lack of a reliable and valid instrument to measure self care knowledge.

#### Significance of the Problem

Cardiovascular disease (CVD) is the leading cause of death in the United States today, accounting for 51% of all deaths [American Heart Association (AHA), 1985]. Myocardial infarctions are the major cause of CVD deaths, accounting for the loss of 566,900 Americans (56% of all CVD deaths) in 1980 (AHA, 1985). It is estimated 1.5 million Americans may have an MI in 1986, 550,000 whom will die (AHA, 1986).

Cardiac education is essential to promote and maintain a patient's health. Patients require knowledge, skills and problem solving abilities prior to administering their own care (Redman, 1984). The rehabilitation model provides the rationale necessitating patient education. The model states that: 1) there is no cure for coronary disease (CAD), 2) the patient is not a passive recipient of care, but initiates self care, and 3) rehabilitation focuses on modifying behavior to improve patient's functional capacity despite chronicity of the disease (Redman, 1984). An individual's knowledge base must be addressed prior to any actual teaching. Based on the teaching-learning process, assessing the learning needs of the patient must precede planning the education period (Bille, 1977).

An instrument to estimate knowledge levels may be utilized to identify subsequent learning needs. Thereby a teaching plan may be implemented to provide information about appropriate lifestyle changes. Modification of cardiac risk factors through lifestyle changes may then reduce incidence of recurrent cardiac events (May, Eberlein, Furburg & Passamani, 1982).

#### Purpose

The purpose of this research was to construct an instrument to measure knowledge of lifestyle changes. The specific objectives were:

1. Identify the self care needs of post MI patients to establish content for the instrument.
2. Test the instrument for reliability and validity.

3. Use the instrument with a group of post myocardial infarction patients to identify knowledge of self care activities.

#### Summary

Chapter One has identified the lack of available instruments to assess knowledge levels of post myocardial infarction patients. The instruments reviewed had no published estimates of reliability and validity. Patient perceptions of self care needs were not used in instrument development. Self care knowledge regarding lifestyle modifications and recognition of signs and symptoms warranting medical attention were not the focus of instruments previously developed. Consequently, extraneous knowledge was tested that may not affect an individual's ability to care for himself. Thus, an instrument to estimate self care knowledge levels was constructed and tested to guide post myocardial infarction patient teaching.

## CHAPTER 2

### CONCEPTUAL FRAMEWORK

The conceptual framework for the study is discussed in Chapter Two. The framework was designed to demonstrate relationships between health beliefs, motivation and knowledge. However, only the knowledge variable is explored at the operational level as only measurement of knowledge was the focus of the present study. Conceptual definitions are also included in the chapter.

#### Construct Level

The conceptual framework is depicted in Figure 1. The construct level proposes a positive relationship between health beliefs and motivation and a positive relationship between motivation and knowledge.

#### Health Beliefs

The Health Belief Model (HBM), first introduced by Rosenstock (1966) and extended by Becker and Maiman (1975) attempted to explain why people behave the way they do regarding preventive health behavior. Four major elements of the HBM are believed to provide the impetus necessary to undertake preventive health behaviors. These elements are: 1) perceived susceptibility or an individual's subjective opinion of his likelihood of contracting a particular illness plus his acceptance of the diagnosis. Antonovsky and Katz (1970) also support this belief.

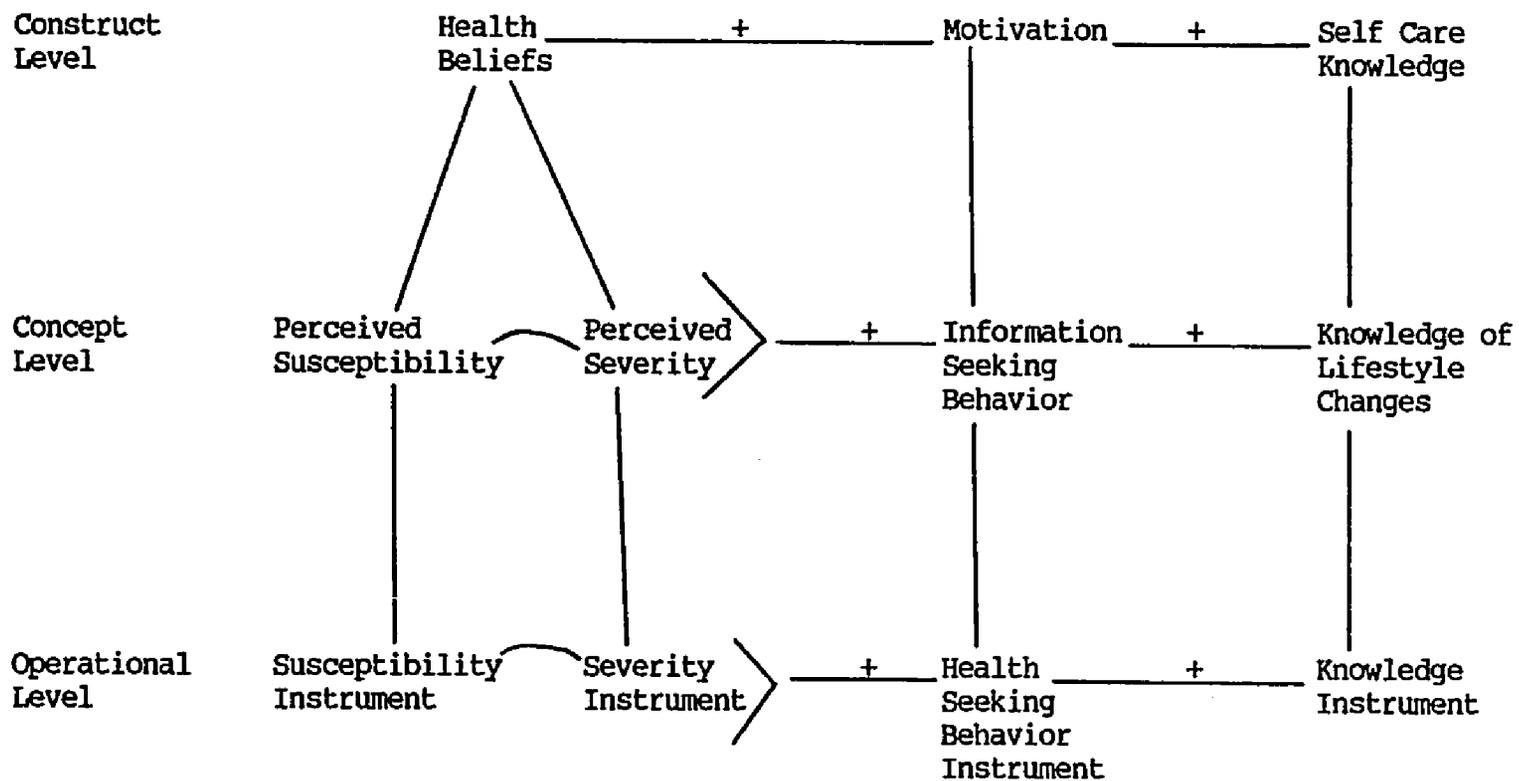


Figure 1. Knowledge of Lifestyle Change Conceptual Framework

2) perceived severity which is defined as an individual's subjective concern of the probably seriousness of the consequences of the illness contracted; 3) perceived benefits of positive aspects of undertaking preventive behaviors; and 4) perceived barriers or negative aspects of undertaking preventive behaviors.

Kegeles (1963) conducted a prospective study based on health belief data he collected in 1958. Both studies were concerned with preventive health behaviors. In the 1958 retrospective study, health beliefs and behavioral data (preventive dental visits) were collected simultaneously on a group of 426 factory employees. Results revealed that individuals who believed themselves to be highly susceptible to dental disorders which were potentially serious made more frequent dental visits than did individuals with low perceived susceptibility and severity beliefs. However, in the 1963 prospective study, only perceived susceptibility was an indicator of frequent preventive dental visits. Fifty-eight percent of those persons with high susceptibility beliefs made preventive dental visits, whereas 42 percent of those with low susceptibility beliefs made dental visits. No relationship was established between perceived severity and preventive dental visits.

Becker, Drachman and Kirscht (1974) conducted a prospective study using 125 children randomly sampled from a total population of children being treated for otitis media. Mothers were interviewed to establish a relationship between compliance with prescribed treatment and health beliefs. A positive correlation between health beliefs and compliance (appointment keeping and medication administration) was

demonstrated. However, a significant relationship was not established between mothers' own health beliefs and their own health care practices.

Haefner and Kirscht (1970) examined the relationship between health beliefs and subsequent health behaviors in 166 university employees. This prospective study demonstrated that a potential threat index can be increased by exposing subjects to informative films on heart disease, cancer and tuberculosis. In addition, immediate intentions of the subjects to seek medical consultation, reduce fat consumption and participate in a regular exercise program were higher in the experimental group versus the control group (individuals who did not view films). Eight months later, a greater percentage of those in the experimental group did have a check-up by their physicians versus those in the control group. However, there were no differences in lifestyle changes between the experimental and control groups. This finding suggests that although health beliefs are factors predictive of health behavior, other variables must be operational for the asymptomatic population. This study was significant because health beliefs were measured prior to an attempt to change them. The change obtained and the initial behaviors were then related to subsequent behavior.

Weisenberg, Kegeles and Lund (1980) conducted a prospective study on a group of children regarding health beliefs and the acceptance of a preventive dentistry program. Findings did not support the HBM. In fact, perceived susceptibility and program acceptance were negatively related. No relationship existed between perceived severity

and program acceptance. These relationships may have occurred as a result of the sample -- children.

In conclusion, a discrepancy between health beliefs and health behaviors has been demonstrated. The relationship depicted in the conceptual framework examines only the relationship between health beliefs and motivation which in turn is positively related to the individual's quest for knowledge. The conceptual framework in Figure 1 demonstrates a positive relationship between health beliefs and motivation. However, studies cited in the above review have discussed relationships between health beliefs and health behaviors. Ben-Sira (1977) examined the relationship between attitudes toward a disease and preventive behavior. He concluded that attitudes toward a disease -- including one's health beliefs -- provide motivation for individuals to seek information that subsequently leads to engaging in new health behaviors.

Becker and Maiman (1980, p. 119) define motivation in health matters as the "degree of interest in and concern about health matters in general". Kirscht (1974a, 1974b) views individual initiative as being a crucial factor in determining how health decisions are made. Redman (1984) identifies emotional readiness or motivation plus experiential readiness and ability to learn as the three determinants of readiness to learn. Motivation "determines the individual's willingness to put forth the effort necessary to learn" (Redman, 1984, p. 28). Experiential readiness includes the "individual's background of experiences, skills and attitudes and his or her ability to learn that which is considered desirable" (Redman, 1984, p. 28).

Ability to recognize a desired future state together with the individual's perceived ability to attain that goal provides energy necessary to engage in a health behavior. If an individual perceives the outcome as being independent of his actions, two states can occur: 1) his motivation is reduced since he does not perceive that his own actions can obtain the desired goal, and 2) fear results due to the uncontrollability of the outcome (Redman, 1984).

Motivation acts as a cue or trigger to take an action. The intensity of the cue variable depends on perceived health beliefs. However, several other factors also serve as cues: 1) interpersonal crisis, 2) interference of the symptoms with a valued activity, and 3) nature and quality of symptoms (Redman, 1984). Only motivation is discussed since it is the construct in the conceptual framework.

Antonovsky and Katz (1970) stated that all behavior is motivated or in other words, goal directed. Three variables -- health enhancement, gaining approval from significant others, and gaining self approval -- are identified as relevant to preventive health behaviors. The relevance of the variables determines the motivational impact. However, the degree of motivation does not assume that the health action will be taken, as other variables may be blocking the action. Internal blocking variables include perceived lack of available time, money, or health care providers. Therefore, despite high motivation health actions may be blocked as a result of internal or external variables. This logic was supported by a study examining preventive dental behaviors.

Ben-Sira (1977) presented a theoretical framework explaining the relationship between attitude and behavior. He proposed that a sequential linking of components of three attitude elements comprises the motivational process resulting in health behavior actions. The elements of attitude are emotional aspects, which contain perceived susceptibility to the disease and the importance of salience of the disease process, cognitive aspect, which contains the understanding of the disease process and instrumental aspect which contains the degree of preventability. Positive health beliefs are predictive of health behavior actions, whereas, positive attitude in either understanding or salience alone is indicative of insufficient motivation to engage in health behavior actions. Testing Ben-Sira's model resulted in a weak link between the cognitive and emotional components. An even weaker link resulted between the cognitive and instrumental components. Therefore, increased susceptibility and salience occurs concomitantly with high understanding and high preventability of the disease, the motivational process can predict an increased likelihood of engaging in preventive health behaviors.

In conclusion, literature supports the link between motivation and knowledge; however, the relationship does not necessarily result in preventable health actions. The documented association between the two constructs substantiates the need for further exploration of the relationship between motivation and knowledge seeking behavior.

### Self Care Knowledge

"Self care is the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health and well being" (Orem, 1980, p. 35). Thereby adequate self care instruction enables the individual to make educated health care decisions.

The concept of self care resulted from several factors. First, chronic illness is the leading cause of death and disability in the United States today. Thus, individuals must learn to adapt to disabilities and chronic illness. Medical care must focus on palliative measures and not on curing, as cure is the goal of acute patient care. The palliative measures can be implemented by the individual, resulting in lower medical care costs and increased patient care responsibility. Second, current life style patterns significantly exacerbate many chronic illnesses. Changes in nutrition, exercise patterns and stress reduction may modify the risk of chronic illness manifestations. Finally, society encourages and recognizes the salience of individual's control of his/her own life, including health. For example, women's free clinics are run by the lay population and are supported by our society (Levin, 1977). As a result of the increased incidence of chronic disease, the high cost of medical care and the demand for individual control in health care decisions, an increased emphasis on self care continues to occur.

Orem (1980) stated self care is the human function both in health and illness; therefore, it is necessary for nurses to identify

patient needs utilizing the three self care assumptions. Appropriate actions are then proposed to assist the individual in meeting his needs or therapeutic self care demands (Orem, 1980). Health deviations include illness; consequently, individual perception of illness and motivation to employ health care behaviors influence the individual's decisions in meeting self care needs. The nurse's ability to assist in proposing health deviation self care activities requires a well rounded medical knowledge-base and an understanding of several health deviation self care categories of which individuals must be aware:

1. Events warranting medical attention and how to seek assistance.
2. The necessity of complying to prescribed therapeutic and rehabilitative regimens.
3. Potential deleterious effects resulting from therapeutic regimens and appropriate measures to combat the effects.
4. The importance of modifying one's self concept and accepting the illness and necessary medical care.
5. The necessity of adjusting life style activities in accordance with particular illness requirements (Orem, 1980).

The information derived from the health deviation self care categories must then be presented to the individual. Levin asked the question, "How does self care education differ from patient education?" (1977, p. 1). The two types of education were distinguished by the following definitions. Patient education assigns the sick role to the learner. Another individual is responsible for care, not the patient. Self care does not assign the sick role, but instead implies a general

meaning of "looking after". The content, methods and outcomes of self care education are determined by the learner, thereby promoting autonomy and individual control. However, in patient education, the goals, methods and outcomes are the responsibility of the professional. Control by the professional is promoted which fosters dependency and adaptation to a medically approved system.

In conclusion, self care information fosters independence and enhances adherence provided the individual places a high value on health. Individuals can evaluate their status and prevent unnecessary, costly physician visits. Or, a medical visit can be expedited in a potentially life threatening situation. Again, the individual's sense of control is enhanced in a society that promotes individual control.

#### Concept Level

The conceptual level of the framework proposed a positive relationship between perceived susceptibility, perceived severity and information seeking behavior. A positive relationship between information seeking behavior and actual knowledge of lifestyle change was also proposed.

#### **Perceived Susceptibility and Perceived Severity**

An individual's perception of how severe his MI was and his perception of how susceptible he/she is to sustaining another MI are two factors that may influence his information seeking behavior. Individuals who perceived their initial MI as severe were more prone to attend clinic appointments than individuals who did not perceive their

MI as severe (Tagliocozzo & Ima, 1970). A positive relationship between perceived severity of illness and knowledge of illness and subsequent clinic attendance was documented. Knowledge of disease alone did not predict clinic attendance, nor did previous experience with other illnesses.

Rahe, Ruffi and Sucher-Arthur (1973) conducted group therapy sessions for post-MI patients immediately following hospital discharge. Perceived severity and actual severity of the MI were not congruent; however, compliance to a prescribed activity program occurred because subjects believed walking had a conditioning effect on the heart muscle. Although all individuals involved in the group therapy sessions had transmural MIs, perceived susceptibility to a subsequent MI was low. Subjects considered themselves to be masculine, strong and minimally susceptible to illness. The minimum perceived susceptibility persisted post-MI.

Bilodieau and Hackett (1971) conducted group therapy sessions for five post-MI patients during which time five themes surfaced. The nature of the illness was emphasized during the first three sessions. The severity of the heart attack and the implications for living were expressed later. The five individuals also found themselves acutely aware of their physical well being and the absence of MI related symptoms. The susceptibility to a subsequent MI was evident in the statement "You know as soon as you feel lousy, you say, 'oh, oh, it's the ticker'" (1971, p. 107). In addition, four of the participants expressed certainty of a subsequent MI. Two individuals stated that

susceptibility to a second MI prompted compliance to their medical regimes.

Although the sample size in Bilodieau and Hackett's (1971) study was small, results are similar to Tagliocozzo's findings. Perceived severity of the illness did lead to compliance with the medical regimen in the former study and clinical attendance in the latter study. Rahe, et al.'s (1973) findings revealed discrepancy between actual and perceived severity of the initial MI. However, the discrepancy may explain why subjects did not perform activities recommended to them, i.e., smoking cessation, dietary modifications, and stress reduction techniques. Rahe concluded that subjects demonstrated a lack of knowledge regarding disease management early in the program.

Gentry and Haney (1975) interviewed post-MI patients 24 hours after hospital admission to document patient education perceptions of the severity of their illness, the agreement to the diagnosis of MI, and the pain levels prehospitalization. The degree to which patients delayed seeking medical attention and individuals who were responsible for decision making prior to hospitalization were two factors also identified. results revealed that individuals' perceived severity and susceptibility correlated positively with faster decision making and reduced delay in seeking medical attention. The study did not assess knowledge levels of patients. Therefore, lack of knowledge of the signs and symptoms of an impending MI may have been a reason individuals delayed seeking medical attention. In addition, eight of the subjects had sustained an MI prior to the MI under study. Results did not

separate this group from the first time MI group. The assessment of knowledge levels and subsequent correlation with perceived severity and perceived susceptibility may have provided useful data in the study of decision making and delay in seeking medical attention behaviors.

In summary, the above three studies cited demonstrated a link between perceived severity, perceived susceptibility and information seeking behavior. The last study demonstrated that perceived severity and perceived susceptibility are positively correlated with self care behaviors; however, information seeking behavior was not addressed, consequently this study cannot be used to support perceived severity, perceived susceptibility and information seeking behavior.

#### Information Seeking Behavior

Information seeking behavior was defined by the investigator as an individual's efforts to acquire information perceived as necessary to maintain one's well being. Information seeking behavior is one aspect of motivation. In other words, an individual will strive to obtain information that will enable him to improve or maintain an acceptable quality of life. The MI patient will be motivated to learn about the lifestyle modifications that will enable him to independently care for himself.

Individuals seek information when they perceive it vital to their survival. Dodge (1969) identified two sets of variables that influence information seeking behavior. Personal variables included age, sex and educational level. Personal variables were not predictive

of amount or type of information individuals seek. Situational variables included the nature of involvement such as medical versus surgical intervention and the term of involvement -- either long term or short term involvement. In Dodge's (1969) study, patients having medically treated illnesses were interested in learning self care measures whereas patients undergoing surgical procedures were more concerned in learning what care had been provided for them. Patients involved in long term care were interested in learning self care activities, whereas patients involved in short term care expressed an interest in learning the details of surgery and pre and postoperative care.

Dodge concluded that patients in her study sought information which enabled them to resume their lives immediately following hospital discharge. Also, patients' perceived informational needs reflected their concern for sustaining life. Patients sought information that enabled them to solve problems imposed by their illness.

In 1971, Rosenberg demonstrated that an individualized education prescription followed by informally conducted group discussion sessions for congestive heart failure patients led to compliance to therapeutic regimens. The subjects in Rosenberg's study had very low incomes and all had less than a high school education. Eighty-four percent of the group expressed that learning about their illness would enhance self care. Information seeking behavior in this group of patients may have been related to their concern for how physicians managed congestive heart failure. This finding supports Dodge's conclu-

sion that individuals seek information they perceive will sustain life. Personal variables of age, sex and educational level did not predict information seeking behavior or attendance at group sessions. These findings are also supportive of Dodge's conclusions.

Pozen, Stechmiller, Harris, Smith, Fried and Voight (1977) studied the effects of cardiac teaching on post-MI patients and their return to work, their ability to stop smoking, lose weight, and level of anxiety. Education was provided daily during hospitalization. Literature was also provided to supplement and reinforce teaching. Knowledge levels were assessed for the experimental and control groups one day prior to discharge, one month after hospital discharge and six months after discharge. Although the experimental group demonstrated higher scores on the knowledge test prior to discharge, both groups had similar scores thereafter. In addition, all scores were low. Weight loss and anxiety reduction were not achieved in either group. The study replicated results in previous studies demonstrating that knowledge does not necessarily predict behavior change. However, knowledge did correlate with an earlier return to work, but occupation prior to MI was not discussed. The previous occupation may have been a contributing factor determining one's return to work. The authors maintained that increased knowledge levels prior to hospital discharge positively influenced earlier return to work by dissipating misconceptions regarding employability.

Smoking cessation occurred more frequently in the experimental group, especially in the high risk patients. Possible perceived sever-

ity and/or perceived susceptibility may have induced smoking cessation behavior. The authors did not provide any explanation for low information seeking behavior following discharge and subsequent low knowledge scores one and six months post-discharge.

In 1984, Dodd conducted a study to assess the effect of chemotherapy drug information and side effect management techniques on knowledge levels, self care behavior and psychological state. Patients who received drug information did increase their knowledge as evidenced by significantly high post test scores. The provision of information on techniques to manage side effects led to higher self care performance scores posttest than on the pretest.

Dodd's study demonstrated that essential self care information led to increased self care knowledge which ultimately led to increased self care behaviors. Information seeking behavior may have been related to the presence of noxious side effects that individuals wished to control. In conclusion, the study demonstrated that individuals seek information that promotes self care.

In summary, the studies supported two factors that promote information seeking behavior: 1) the importance of patients concern to sustain life, and 2) the ability to prevent or solve problems imposed by their illness.

#### Knowledge of Lifestyle Changes

Redman (1984) defined knowledge of lifestyle change as an individual's ability to demonstrate an understanding of necessary

changes related to risk factor reduction. Health education, which is "any combination of learning opportunities designed to facilitate voluntary adaptations of behavior conducive to health," (Kolbe, Iverson, Kreuter, Hochbaum & Christenson, 1981, p. 21), has provided the avenue enabling health care professionals to supply information to a cardiac patient to guide decisions he makes regarding self care (Parcel & Baranowski, 1981). Knowledge alone is not predictive of health behavior or lifestyle changes or self care activities. A variety of factors including health beliefs, values and motivation influence health care decisions and patient behavior. Therefore, a second function of health education is to provide support to the patient that will enable him to perform the desired health behaviors.

Acquiring and synthesizing cardiac self care information establishes understanding which then is used to improve the quality of the decision making process. Since knowledge is a cognitive process, it is not directly measurable, however, knowledge can be demonstrated behaviorally by an individual's ability to define, describe, identify, label, outline, select or state an expected outcome (Redman, 1984).

Before information can be provided to a patient it is important to assess the learning needs of the individual. The administration of a knowledge questionnaire is a commonly used technique to assess a patient's current knowledge and future learning needs regarding lifestyle changes. For example, Rahe, et al. (1975) developed a questionnaire to assess patients' knowledge of post-MI management. Administration of the instrument prior to the formal teaching program

served as a baseline estimate and the second administration following the teaching program demonstrated knowledge attainment. Patient learning was a measure of program success. Since knowledge scores were similarly low pre and post teaching the authors concluded that an educational program was ineffective during the first two weeks of hospitalization as patients readiness to learn was low due to preoccupation with immediate survival and not on post discharge self care needs. Linde and Janz (1979) pre and post tested a group of patients undergoing open heart surgery. Knowledge scores were significantly higher on the post test which was administered following a comprehensive postoperative patient education program. The authors concluded that the teaching program was successful. In addition to higher knowledge scores, lifestyle changes after hospital discharge were greater for those who received the education program. These results were interpreted by the authors as effective patient education.

#### Conceptual Definitions

1. Perceived Susceptibility. An individual's subjective opinion of his likelihood of sustaining another myocardial infarction and his acceptance of the diagnosis of myocardial infarction (Becker & Maiman, 1975).

2. Perceived Severity. An individual's subjective concern of the probable seriousness of the myocardial infarction he sustained and the seriousness of the consequences of the myocardial infarction (Becker & Maiman, 1975).

3. Information Seeking Behavior. An individual's efforts to acquire information he believes will enable him to care for himself following myocardial infarction (Dodge, 1969).

4. Knowledge of Lifestyle Changes. An individual's ability to demonstrate understanding of necessary modification related to risk factor reduction (Redman, 1984).

#### Summary

In Chapter Two a positive relationship was demonstrated for health beliefs and motivation and self care knowledge on the construct level. In addition, positive relationships between perceived susceptibility, perceived severity and information seeking behavior were demonstrated on the concept level. These findings, derived from review of the literature, have provided the foundation for the conceptual framework.

Patients who have sustained an MI have a magnitude of perceptions regarding the severity of the MI and susceptibility to another MI. These perceptions positively relate to an individual's information seeking behaviors regarding self care. In addition, patients concerns to sustain life and prevent or solve problems related to illness result in seeking information related to necessary lifestyle changes. Finally the ability to reliably and validly estimate a cardiac patient's knowledge of lifestyle changes may provide health care professionals with valuable information that may be used to provide educational opportunities for cardiac patients and their families.

## CHAPTER 3

### METHODOLOGY

Instrument construction and the data collection procedure undertaken to test the instrument are described in Chapter Three. The design, sample, setting and analysis of data are also discussed.

#### Design

A descriptive study was implemented to develop an instrument and establish reliability and validity. The instrument was used to describe knowledge in the same group of post-myocardial infarction patient.

#### Setting

The study was conducted in two outpatient settings. A physician's office and an outpatient cardiac rehabilitation program were the sites of data collection.

#### Sample

Twenty-six subjects were selected as a convenience sample. The subjects met the following criteria:

1. Spoke, read and wrote English.
2. Had at least one documented MI within one year.
3. Knew of the myocardial infarction diagnosis.

4. Were taking sublingual nitroglycerine on a prn basis.

Demographic information and self care behaviors related to risk factor reduction were also collected using the instrument in Appendix A.

#### Human Subjects Approval

The study was approved by the Human Subjects Committee of the University of Arizona (Appendix B) and received approval for data collection from a Phoenix tertiary care institution (Appendix C). The right to refuse or withdraw from the study was explained and confidentiality was maintained by assigning a code number to each subject. Appendix D contains a copy of the disclaimer.

#### Data Collection Protocol

##### Background

Several instruments have been developed to assess knowledge levels of cardiac patients. However, the content of these instruments has been a potential problem or error source. In addition to lifestyle modifications, other information — knowledge of anatomy, physiology, disease process and treatments during hospitalization which may not be vital to an individual's self care — was included. The inability to recall emergency treatments in the hospital setting does not assist the patient in monitoring his health progress post discharge. Instrument content is only one source of error; reliability and validity of the instruments published is another error. Murdaugh (1982) reviewed ten

knowledge questionnaires and discovered that pilot testing often was not done. Also, accuracy of what was intended to be measured and what was actually measured was not assessed, consequently incongruency may have occurred.

Linde and Janz's (1979) instrument assessed knowledge levels of preoperative cardiac patients but did not discuss reliability of the instrument. Content validity was performed incorrectly as patient responses to items were compared with program content presented. Content validity must be established by experts in the field of cardiac patient education who agree that the domain of cardiac self care information is adequately sampled. Christopherson and Pfeifer (1980) only established face validity of their preoperative knowledge assessment instrument. Face validity is not as comprehensive as content validity because one only states that item content "seems to pertain" to the knowledge base.

Rahe, et al. (1975) developed an instrument to estimate knowledge levels of MI patients before and after an inpatient cardiac teaching program. Reliability and validity was not discussed; however, the instrument was revised to clarify items. Multiple choice distractors were changed to improve accuracy. The revised instrument was used in a second study by Scalzi, Burke and Greenland (1980) who also did not report reliability or validity estimates.

Boggs, Malone and McCulluch (1978) developed an instrument to assess patients' understanding of illness and lifestyle changes. Reliability and validity testing was not addressed. The questionnaire

was designed for hospitalized patients; however, directions were unclear and inconsistent. A uniform format of multiple choice items may have alleviated confusion posed by a complex list item.

Bodan (1983) designed her instrument using untested instruments of Boggs, et al. (1978) and Rahe, et al. (1975). No reliability or validity testing was discussed. Owens, et al. (1978) established content validity of her instrument with a review by four specialists. Johnston, Cantwell and Fletcher's (1976) instrument to evaluate the success of an inpatient cardiac rehabilitation program did not undergo reliability or validity testing. Telephone interviews were conducted as followup to assess favorable lifestyle modifications. The authors concluded that behavior changes did occur and were a result of knowledge gained from the education program. Instead, data collected by the interviewer, i.e., body weight, blood pressure determination, and stress testing, would provide objective information more useful in assessing behavior change.

The identification of limitations in previously published instruments has led to the present development of a knowledge of lifestyle instrument. The limitations included: 1) lack of self care content, 2) lack of reliability and validity estimates, and 3) lack of patient input in instrument construction.

#### Instrument Construction

The Knowledge of Self Care instrument was based on information obtained from three sources -- patient interviews, dietitian inter-

views, and American Heart Association (AHA) guidelines. Content domain was obtained from all three sources. First, interviews with six post-MI patients were conducted to identify self care learning needs following hospital discharge. Based on the information obtained, several areas of concern were identified including weight reduction and dietary concerns, medication side effects, stress management, smoking cessation, and physical activity. Patients stated that they were comfortable in meeting their own self care needs. Second, dietitians were interviewed about cardiac diet recommendations. Reading food labels to determine produce content was identified as one important self care need. Restriction of sodium, cholesterol, fat and sugar were also identified as important factors in a cardiac patient's self care. Finally, the AHA guidelines were reviewed to identify areas of concern addressed in patient education literature. The guidelines included all six modifiable risk factors important to cardiac patient education. In addition, recognition of the warning signals of an impending MI was also stressed.

Information obtained from the three sources was compiled and seven subscales were constructed for the patient knowledge instrument. These subscales were stress, diet, high blood pressure, smoking, signs and symptoms, exercise and medication. Content domain was established as all three sources identified similar self care subscales.

After the content was defined, instrument format was selected based on published measurement and evaluation literature. A multiple choice format consisting of a single stem and three distractors was

chosen. Multiple choice items are "adaptable to the measurement of most important educational outcomes -- knowledge, understanding and judgment, ability to solve problems, to recommend appropriate action, to make predictions" (Ebel, 1965, p. 149). A major disadvantage of the multiple choice format is the difficulty of formulating clear, concise, factually correct and important items with definitely incorrect yet plausible attractive distractors (Ebel, 1965). Three distractors were selected to increase discrimination and reduce guessing. Items were not stated negatively because of possible confusion. Correct answers were randomly ordered using a table of random numbers. Items were arranged randomly according to subscale.

#### Instrument Testing

A content validation study was conducted initially to establish content validity including the clarity and conciseness of items. Four registered nurses with cardiovascular expertise critiqued the instrument to: 1) assess the adequacy of content domain sampling, 2) assure that only one answer was correct for each item, 3) accurately identify the proper subscale for each item, and 4) decide whether or not the item was a self care concern (Appendix E). The instrument was then revised based upon experts' suggestions. The instrument was resubmitted to the experts for final approval of all items.

Following the revisions, the instrument (Appendix F) was administered to a group of MI patients. Subjects were asked to complete the instrument in the setting of their choice. After informed consent, each

subject received a numbered packet containing the demographic data sheet and the self care knowledge instrument. They were asked to return the instrument within 48 hours in the self-addressed, stamped envelope. Subjects who agreed to participate were also asked to complete another self care knowledge questionnaire two weeks after completing the initial ones. Their names and addresses were kept on a separate sheet to assure anonymity and records were destroyed following completion of the study. Subjects were also asked to return the second questionnaire within 48 hours after receiving it.

#### Data Analysis Plan

Descriptive statistics were used to analyze demographic data. Two week test-retest reliability was performed to establish stability of the instrument using Pearson Correlation Coefficients. Internal consistency was estimated using the Kuder-Richardson formula for dichotomous data. Content validity was established as described by the four experts. Concurrent validity was estimated by relating lifestyle change behaviors with knowledge of lifestyle scores. Point biserial coefficients were the validity coefficient of choice.

Criterion levels for reliability were .70 for both test-retest and internal consistency. A validity coefficient of .70 was considered adequate for a new scale.

#### Summary

In conclusion, the knowledge instrument was developed using information from cardiac patient interviews, dietitian interviews, and

AHA guidelines. Validity and reliability estimates were conducted to provide a valuable assessment tool to document cardiac learning needs.

## CHAPTER 4

### RESULTS

Chapter Four describes the results of the data analysis. The sample is described, the reliability and validity testing results of the Knowledge of Lifestyle Instrument is presented and the knowledge level of the sample is addressed.

#### Description of Sample and Demographic Questionnaire

Descriptive statistics were used to analyze the demographic data. Twenty-six subjects participated in the study. The Knowledge of Lifestyle Instrument was administered to each subject immediately after hospital discharge and again two weeks later. The subjects ranged in age from 38 to 73 years [Mean ( $\bar{x}$ ) =59, standard deviation (s.d.) =9.4]. There were 20 male (77%) and six female (23%) subjects. All individuals had sustained a myocardial infarction within a 12 month period prior to testing. Six (23%) individuals had sustained two previous MIs. Eight (31%) individuals had undergone coronary artery bypass surgery prior to their most recent MI.

All 26 subjects received education about their disease during hospitalization. Twenty-two (85%) subjects reported that family members were included in the education discussions. Twenty-one (81%) subjects reported that physicians took primary responsibility for discussing the MI, whereas the subjects stated nurses provided information for 8% of

the subjects. Counselors and rehabilitation staff were responsible for education of 11% of the subjects.

Eighty-one percent (N=21) of subjects indicated they also received information about their MI after they were discharged from the hospital, while 19% (N=5) of the subjects indicated no information was received following discharge. Of those individuals who reported receiving information post discharge, 50% (N=13) reported that family members were included in the information discussions. Physicians were reported as being responsible for providing information for 67% of the subjects. Cardiac Rehabilitation staff were reported to be responsible for 24% of subjects. Hospital staff and nurses were reported by the subjects to be responsible for discussing the MI after discharge for 9% of the subjects.

Twenty-five (96%) subjects stated they exercised following hospital discharge. The subjects (N=24) participated in one outpatient cardiac rehabilitation program. Program participation ranged in length from six to 36 weeks with an average of 18 weeks (s.d.=11 weeks). Five individuals did not mention the number of weeks in the program they had completed.

Three individuals (12%) reported participating in a stress class which was 30 to 60 minutes in length. Five subjects (19%) reported participating in a weight reduction program which was incorporated on a daily basis in the cardiac rehabilitation program. No subject had been involved in a smoking cessation program. Eight individuals (31%) reported taking a CPR class in the rehabilitation program.

The class was one to three hours in length. Three subjects (12%) reported taking a high blood pressure class. The class was 30 to 60 minutes long.

Twenty-two (84%) subjects stated they were taking cardiac medications. However, chart documentation revealed that all 26 subjects had nitroglycerine prescribed for angina.

Nineteen (73%) reported they followed a low sodium, low cholesterol, low fat diet while six subjects indicated they followed either reduced calorie, regular or common sense diets. One subject did not respond to the diet question. Reported body weight prior to the MI ranged from 103 pounds to 325 pounds with an average weight of 180.5 pounds. Reported body weight following the MI ranged from 103 pounds to 299 pounds with an average of 168 pounds. Thus, patients lost weight following the cardiac event.

Nine subjects (35%) reported they had been diagnosed with high blood pressure prior to their MI while three subjects (12%) reported a diagnosis of high blood pressure following the MI. Seven subjects (27%) reported they smoked prior to their MI. All but one individual ceased to smoke following the MI. Thirteen individuals (50%) reported they were under stress prior to their MI. Ten individuals (39%) indicated continued stress following the MI.

Eight subjects (31%) stated they were not involved in regular physical activity prior to their MI. Fourteen subjects (54%) stated they did engage in physical activity one to seven times per week prior to the MI. Activities included walking, jogging or swimming. Four

individuals did not complete the question. Following the myocardial insult, all but one individual participated in a regular physical activity program which consisted of walking in 92% of the cases. Subjects reported exercising 10 to 90 minutes per day ( $\bar{x}$ =45 minutes) prior to the MI and 15 to 60 minutes day ( $\bar{x}$ =45 minutes) following the MI.

#### Description of Reliability Estimates

The instrument was assessed for reliability. Both stability and internal consistency were estimated.

##### Stability

Two week test-retest reliability was performed to establish instrument stability. Phi and Pearson correlation coefficients were used. A criterion level of .70 was selected as acceptable for the new developed instrument. For item test-retest reliability, only three items (numbers 3, 13 and 34) met the .70 criterion level. However, three of the items (numbers 18, 25 and 38) met a criterion level of .60 or better. For subscale test-retest reliability, one subscale, medications, met the .70 criterion level. The total scale test-retest reliability coefficient was .54. Thus the instrument did not meet the criterion level for stability. See Tables 1 and 2 for details of the stability testing.

##### Internal Consistency

Internal consistency estimation included item to item correlations and subscale to subscale correlations. The preset criterion levels for item to item correlations were .30 to .70, while the

Table 1. Stability Testing: Two Week Item  
Test-Retest Reliability  
(Phi Coefficients, N=26)

Item Number	Subscale	Test-Retest Coefficient
3	Diet	.81*
13	Diet	.87*
34	Medication	.73*
18	Stress	.64
25	Medication	.65
38	Stress	.64

\* Met .70 criterion level

Table 2. Stability Testing, Two Week Subscale and  
Total Scale Test-Retest Reliability  
(Pearson Correlation Coefficients, N=26)

Subscale	Test-Retest Coefficient
Activity	.35
Blood Pressure	.28
Diet	.40
Medication	.70*
Signs	-.15
Smoking	.30
Stress	.39
Total Scale	.54

\* Met .70 criterion level

subscale to subscale correlations were .50 or greater. Alpha coefficients using the Kuder-Richardson formula for dichotomous data were used for the internal consistency estimate. A criterion level of .70 was set.

Inspection of the item to item correlations of the stress subscale revealed only three items correlated between .30 and .70. The subscale mean was .85. The mean subscale to subscale correlation was .13. The standardized alpha was .42. However, on the retest there were eight item to item correlations at the .30 to .70 level. The subscale interitem correlation mean was .34 and the standardized item alpha was .72.

On the activity subscale, four out of seven items had a zero variance. None of the item to item correlations met the preset .30 to .70 criterion level. The subscale item mean was .70. The mean interitem subscale correlation was  $-.12$  with a standardized alpha of  $-.47$ . On the retest, five items had a zero variance. None of the item to item correlations met the .30 to .70 criterion level. The subscale item mean was .44. The mean interitem subscale correlation was .14 and the standardized alpha was .25.

The blood pressure subscale had one item to item correlation that met the .30 to .70 criterion level. The subscale item mean was .60. The mean interitem subscale correlation was .14. The standardized alpha was .39. No item to item correlations met the .30 to .70 level on the retest.

One item to item correlation met the .30 to .70 criterion level for the diet subscale. The item subscale mean was .75. The mean inter-item subscale correlation was  $-.03$  and the standardized alpha was  $-.20$ . No items correlated at the preset .30 to .70 criterion level on the retest.

On the medication subscale, two item to item correlations met the preset .30 to .70 criterion level. The subscale item mean was .68 and the mean interitem subscale correlation was .08. The standardized alpha for the subscale was .65. Four item to item correlations met the .30 to .70 level on the retest. The item subscale mean was .84; however, the mean interitem subscale correlation was .19. The standardized alpha was .48.

Two item to item correlations met the .30 to .70 criterion level on the smoking subscale. The subscale item mean was .80. The mean interitem subscale correlation was .14. The standardized alpha was .39. Only one item to item correlation met the .30 to .70 criterion level on the retest. The subscale item mean was .77 and the interitem correlation was .31. The standardized alpha was .58.

Only one item to item correlation met the .30 to .70 criterion level on the signs subscale. The subscale item mean was .71. The mean interitem subscale correlation was .04. The standardized alpha was .13. No item to item correlations met the .30 to .70 level on the retest. The mean interitem subscale item was .23 and the standardized alpha was .37.

Forty-three item to item correlations met the .30 to .70 criterion level for the total test. The total scale mean was .73. The mean interitem correlation was .05; however, the standardized alpha was .59. The retest interitem correlation and standardized alpha remained in the same ranges. See Table 3 for details of the internal consistency coefficients.

#### Description of Validity Estimates

Two types of validity were estimated. Content validation was previously discussed in Chapter Three. Concurrent validity estimates were also done to estimate construct validity.

#### Concurrent Validity

Concurrent validity was estimated by correlating knowledge of lifestyle with self-reported changes in lifestyles (behavior). The knowledge scores on the activity, stress, smoking, diet and blood pressure subscales were correlated with the activity, stress, smoking, diet and blood pressure levels reported by the subjects. Point biserial coefficients were obtained. A .70 criterion level was set.

None of the subscales knowledge scores were correlated at the .70 criterion level with the corresponding self-reported activities (see Table 4). However, the stress subscale knowledge score significantly correlated with self-reported activity (Point biserial=.44), although it did not meet the .70 criterion level. The smoking subscale knowledge score significantly correlated with self-reported blood pressure changes (point biserial=.39). Again, the .70 criterion level was not met.

Table 3. Internal Consistency Testing:  
 Subscales and Total Scale  
 (Alpha Coefficients, N=26)

Subscale	Alpha Coefficient	
	Initial Test	Retest
Stress	.42	.71*
Activity	-.47	.25
Blood Pressure	.28	.39
Diet	-.20	-.01
Medication	.64	.48
Smoking	.39	.57
Signs	.13	.37
Total Scale	.59	.59

\* Met .70 criterion level

Table 4. Concurrent Validity Testing, Relationship of Lifestyle Scores with Self-Reported Changes in Lifestyle Behavior (Point Biserial Coefficients, N=26)

Subscale	Self-Report Behavior	Phi Coefficient
Activity Stress	Activity	-.04 .44
Diet	Weight	.14
Stress	Stress	-.04
Blood Pressure Smoking	Blood Pressure	-.27 .39
Smoking Stress	Smoking	.00 .29

In summary, none of the phi correlations met the .70 criterion level for establishing concurrent validity. Possible reasons will be discussed in Chapter Five.

#### Description of Total Scale

The Knowledge of Lifestyle Instrument contained 39 items for a maximum possible score of 39. The initial knowledge scores ranged from 29 to 37 ( $x=32.4$ ,  $s.d.=2.7$ ). The retest scores ranged from 28 to 37 ( $x=33.2$ ,  $s.d.=3.0$ ). A very small increase in scores occurred between the initial test and the retest; however, as noted, the knowledge scores were high initially.

#### Summary

In conclusion, demographic data revealed that most subjects received information about their MI during hospitalization as well as after hospital discharge in an outpatient cardiac rehabilitation setting.

Test-retest reliability, a measure of stability, did not meet the preset criterion level of .70 for the total scale. Internal consistency, a measure of reliability, did not meet the preset criterion level of .70 for the total scale. The stress subscale did meet the .70 criterion level on the retest only. Concurrent validity was estimated by comparing subscale knowledge scores with self report behaviors. Point biserial coefficients did not meet the preset .70 criterion level.

## CHAPTER 5

### CONCLUSIONS

The results of the data analysis are discussed in Chapter Five. Conclusions regarding the sample and reliability and validity estimates are addressed. In addition, study limitations are identified and possible implications for nursing practice are addressed.

#### Description of the Sample

Twenty-six subjects volunteered to participate in a study to develop and test an instrument to measure post myocardial infarction patients' knowledge levels of cardiovascular risk factors. The convenience sample was very homogenous as 24 (92%) subjects were actively involved in an outpatient cardiac rehabilitation program. The subjects had been exercising and attending education classes for a minimum of six weeks prior to completing the instrument for the first time. The investigator did not attempt to administer the instruments at a predetermined point in the cardiac program. Cardiac class content varies for each participant, therefore, it was not possible to test individuals at similar educational levels.

The subjects were motivated to receive information about self care activities as evidenced by their attendance in a structured rehabilitation program. The combination of sample homogeneity, motivation to obtain information and participation in a structured

activity and education program may explain the high knowledge scores and lack of variance on several items. The activity subscale which measured subjects' ability to identify safe physical activity choices have five, of seven possible, items with a zero variance. The signs subscale, which measured subjects' ability to identify physical symptoms warranting intervention, had three of five items with a zero variance. All the subjects knew the correct answers to these items.

### Reliability

Instrument stability was assessed using test-retest reliability. However, knowledge of lifestyle changes may not be stable in a group of individuals over a two week period due to informal and formal cardiac education classes conducted in a cardiac rehabilitation setting. Item answers did not remain consistent for the two testings. Only three items met the .70 criterion level. The remaining 36 items were answered differently demonstrating either a change in knowledge in the subjects or lack of item clarity. Since the subjects' scores changed little, lack of item clarity was the probable cause. Two diet subscale items and one medication subscale item did remain stable. Also, two stress items and one medication subscale item were greater than .60, indicating some stability. The medication subscale was the only subscale to meet the .70 criterion, indicating subjects had probably gained knowledge of their medication during hospitalization and the knowledge did not change.

Internal consistency was estimated using the coefficient alpha. Only the stress subscale met the .70 criterion level. The medication

subscale did have an alpha coefficient of .65. The total test also had an alpha coefficient of .59. Due to the high knowledge levels of the population tested and the relative simplicity of the items in the subscales, zero variances occurred for 13 items. Therefore, additional items would be necessary to improve the reliability coefficient. In addition, the scale needs to be tested in subjects prior to any educational efforts to see whether or not the items are discriminating between patients who have been taught with those who have not been taught. Stable test-retest coefficients may be obtained with subjects who have graduated from a cardiac rehabilitation program.

#### Validity

Content validity was established by a panel of four nurses with cardiovascular expertise. Experts initially reviewed each instrument item and selected correct response and subscale. Items were revised based on cardiac experts suggestions. Questionnaire II (Appendix E) was administered next. Subscale definitions were provided. Item clarity, correct response and correct subscale identification were evaluated. For each item, the experts identified the correct item subscale in 86% of the cases. The correct item answer was identified in 86% of the cases. Item clarity was favorable in 75% of the cases. Content validation was adequate; however, further development of items would be useful to improve item clarity.

Construct validity was estimated by examining the relationships between self care knowledge and self care behaviors. The conceptual framework (Chapter 2, Figure 1) depicts a positive relationship between

knowledge and behavior. However, none of the subscales demonstrated a significant correlation with the appropriate self reported behavior.

Some explanations for insignificant correlations include:

1. A minimal time was allowed for a change in behavior. A short time lapse between the myocardial infarction event and the initial testing occurred.
2. A high level of knowledge may not be a justifiable correlate with changes in behavior. Variables other than knowledge may have influenced subjects' involvement in behavior change. For example, a high degree of support provided subjects by health care team members may have resulted in necessary lifestyle changes. A .44 correlation did occur for the knowledge of stress subscale and physical activity, indicating stress may play a role in participation in physical activity. Possibly, control of stress through physical activity was a motivation to exercise. A reduction in blood pressure did correlate at .39 with the smoking subscale. An explanation for this was unknown.

The small sample size did not allow for adequate validity testing. Factor analysis was not done due to inability to establish significant clusters with a small sample.

#### Implications to Nursing

The ability to estimate the knowledge level of post MI patients would provide nurses a meaningful method to identify patients future learning needs. However, criterion levels for reliability (test-retest

and internal consistency) of .70 were not met. A .70 validity coefficient was also not met for construct validity. As a result, the instrument cannot be used in its present form. Reconstruction and expansion of items and further reliability and validity testing is necessary prior to use in a clinical setting.

A potential implication is related to the lack of significant correlation between knowledge and self reported behaviors. Maybe nurses need to rethink the amount of knowledge patients need to change behaviors. Other variables, such as support and stress reduction, may be more important than knowledge and need further exploration.

#### Study Limitations

The small sample size was a major limitation in this study. Twenty-six subjects completed the two questionnaires. Seven subscales were included in the instrument, consequently, a minimum of five subjects per subscale for a total of 35 subjects were needed for a more stable testing.

The sample's homogeneity was also a limitation. Twenty-four subjects were participating in the same cardiac rehabilitation program. Subjects were continuously exposed to cardiac education during cardiac rehabilitation classes. As a result, instrument stability may have been affected. In addition, item difficulty may have been reduced due to education received. A total of nine items on the initial test and thirteen items on the retest were deleted due to zero variance.

A fourth limitation was the volunteer nature of the sample. Individuals who were motivated to participate may have had greater motivation to obtain cardiac knowledge.

Finally, concurrent validity testing was not conducted at an optimal time. A change in behavior was measured by the following objective criteria: change in blood pressure, weight, stress, amount of physical activity and smoking patterns pre and post myocardial infarction. In most cases the time interval between the two events was three to four weeks which did not allow time for significant changes to occur.

#### Suggestions for Future Research

To improve the quality of the Knowledge of Lifestyle questionnaire, several recommendations must be implemented. New items are needed for several subscales — diet, activity, smoking, signs and symptoms, and blood pressure — due to the unacceptable reliability coefficient alpha and validity phi coefficients. A less homogenous, volunteer sample could be obtained by eliciting participation from post MI patients in cardiologists offices rather than through the cardiac rehabilitation programs. Patients who have undergone subsequent coronary artery bypass surgery post MI or who have received streptokinase therapy or coronary artery balloon angioplasty might promote less homogeneity. Sample size needs to include a minimum of 35 subjects. Concurrent validity testing needs to be conducted at least three months post event to allow for significant changes in objective criteria. Reliabil-

ity and validity testing must be repeated. Factor analysis may be conducted if the sample size can generate significant clusters.

Implementation of suggested recommendations may increase the value of the instrument by increasing the reliability and validity coefficients. Once validity and reliability standards are met the instrument could be used in a clinical setting to assist in identifying learning needs of cardiac clients.

#### Summary

In conclusion, development and testing of an instrument to estimate knowledge of necessary lifestyle changes by post MI patients was undertaken. A homogenous sample participating in a cardiac rehabilitation program had high scores on the test, indicating a fairly high level of knowledge. In addition, reliability and validity estimates indicated the instrument was not stable or internally consistent in the sample tested and did not evidence concurrent validity. Consequently, further revisions and testing are needed prior to clinical application of the instrument.

**APPENDIX A**

**DEMOGRAPHIC AND RISK FACTOR QUESTIONNAIRE**

DEMOGRAPHIC and RISK FACTOR  
QUESTIONNAIRE

Please complete the following questions.

Age: \_\_\_\_\_ Sex: \_\_\_\_\_

1. What was the date of your most recent heart attack? \_\_\_\_\_
2. Have you had a previous heart attack?  
YES\_\_\_ Date\_\_\_\_\_ NO\_\_\_
3. Did you ever have bypass surgery?  
YES\_\_\_ Date\_\_\_\_\_ NO\_\_\_
4. Did you receive any information about your most recent heart attack while you were in the hospital?  
YES\_\_\_ NO\_\_\_  
If yes, was your family involved in the discussion? YES\_\_\_ NO\_\_\_  
If yes, who discussed the heart attack with you?  
\_\_\_\_\_
5. Did you receive any information about your most recent heart attack after you left the hospital?  
YES\_\_\_ NO\_\_\_  
If yes, was your family involved in the discussion?  
YES\_\_\_ NO\_\_\_  
If yes, who provided the information for you?  
\_\_\_\_\_
6. Did you participate in an exercise program after you left the hospital? YES\_\_\_ NO\_\_\_  
If yes, where? \_\_\_\_\_  
How long was the program? \_\_\_\_\_

7. Since your most recent heart attack, have you participated in:

a) A stress management class? YES\_\_\_ NO\_\_\_

If yes, where? \_\_\_\_\_

Class length \_\_\_\_\_

b) A weight reduction class? YES\_\_\_ NO\_\_\_

If yes, where? \_\_\_\_\_

Class length \_\_\_\_\_

c) A smoking cessation class? YES\_\_\_ NO\_\_\_

If yes, where? \_\_\_\_\_

Class length \_\_\_\_\_

d) A cardiopulmonary resuscitation class?

YES\_\_\_ NO\_\_\_

If yes, where? \_\_\_\_\_

Class length \_\_\_\_\_

e) A high blood pressure class? YES\_\_\_ NO\_\_\_

If yes, where? \_\_\_\_\_

Class length \_\_\_\_\_

f) A cardiac rehabilitation program?

YES\_\_\_ NO\_\_\_

If yes, where? \_\_\_\_\_

Class length \_\_\_\_\_

8. What medications are you taking now?

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9. What diet do you follow? \_\_\_\_\_

10. Please complete the following table by filling in the blank space or circling your response.

BEFORE HEART ATTACK		NOW	
WEIGHT	_____pounds	_____pounds	
HIGH BLOOD PRESSURE	YES NO	YES NO	
CIGARETTE SMOKING	YES NO	YES NO	
STRESS	YES NO	YES NO	
ACTIVITY How often?	_____per week (number of times)	_____per week (number of times)	
What Kind?	walk/bike/jog/swim _____other	walk/bike/jog/swim _____other	
How long?	_____minutes	_____minutes	

APPENDIX B

HUMAN SUBJECTS APPROVAL



## THE UNIVERSITY OF ARIZONA

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COLLEGE OF NURSING

## MEMORANDUM

TO: Amelia Steinbinder  
4015 N. 12th Ave  
Phoenix, AZ 85013

FROM: Ada Sue Hinshaw, PhD, RN <sup>ASH</sup> Katherine Young, PhD, RN  
Director of Research Chairman, Research Committee

DATE: October 17, 1984

RE: Human Subjects Review: Instrument Development to Assess  
Knowledge of Lifestyle Change

Your project has been reviewed and approved as exempt from University review by the College of Nursing Ethical Review Subcommittee of the Research Committee and the Director of Research. A consent form with subject signature is not required for projects exempt from full University review. Please use only a disclaimer format for subjects to read before giving their oral consent to the research. The Human Subjects Project Approval Form is filed in the office of the Director of Research if you need access to it.

We wish you a valuable and stimulating experience with your research.

ASH/fp

**APPENDIX C**

**AGENCY ACCESS APPROVAL**



**ST. JOSEPH'S**  
HOSPITAL AND MEDICAL CENTER

Post Office Box 2071  
Phoenix, Arizona 85001-2071  
285-3000 (Area 602)

April 8, 1985

Amelia Steinbinder, R.N.  
4015 N. 12th Avenue  
Phoenix, Arizona 85013

Dear Ms. Steinbinder,

The Nursing Research and Publications Committee reviewed your proposal "Instrument Development to Assess Knowledge of Lifestyle Change" on March 28, 1985. Your proposal was approved pending the inclusion of a statement regarding the disposal of the participants' names and addresses at the conclusion of the study.

The proposal will be reviewed by the Medical Research and Publications Committee on April 9, 1985. You will receive notice of this committee's decision approximately one week after the meeting.

St. Joseph's is very excited about your study and wishes you great success with the completion of the project.

Sincerely,

A handwritten signature in cursive script that reads "Carol Huie".

Carol Huie, R.N., M.S.  
Associate Administrator  
Nursing Services  
Chairman, Nursing Research and  
Publications Committee

CH:dg



**ST. JOSEPH'S**  
HOSPITAL AND MEDICAL CENTER

*Division of Mercy Health System*

350 West Thomas Road  
Post Office Box 2071  
Phoenix, Arizona 85001-2071  
285-3000 (Area 602)

April 15, 1985

Amelia Steinbinder  
4015 North 12th Avenue  
Phoenix, Arizona 85013

Dear Ms. Steinbinder,

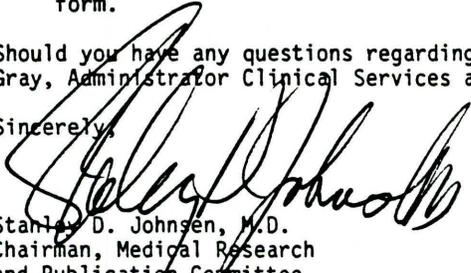
On April 9, 1985 the Medical Research and Publication Committee of St. Joseph's Hospital and Medical Center approved your research project entitled "Instrument Development to Assess Knowledge of Lifestyle Changes" and the consent form as submitted.

The guidelines established by HHS and this Committee require you as principal investigator to be responsible for:

1. Providing the in-patient medical record with copies of signed consent forms from each individual participating in the study. If the patient is a minor, a copy of the consent form is to be given to the patient's parents or guardian. Out-patient studies consent forms must be available from your office for any F.D.A. inspection.
2. Reporting all patient adverse effects and deaths to the chairman of the committee.
3. Submitting a status report to the chairman of the committee on an annual basis.
4. Reporting to the committee any changes in the protocol or consent form.

Should you have any questions regarding the above please contact Vita Gray, Administrator Clinical Services at 285-3249.

Sincerely,

  
Stanley D. Johnson, M.D.  
Chairman, Medical Research  
and Publication Committee

SDJ:rc

ST. JOSEPH'S HOSPITAL AND MEDICAL CENTER  
NURSING RESEARCH COMMITTEE  
SUMMARY FORM



**ST. JOSEPH'S**  
HOSPITAL AND MEDICAL CENTER

Post Office Box 2071  
Phoenix, Arizona 85001-2071  
285-3000 (Area 602)

Please complete the following questions:

1. How will the study contribute to nursing practice or policy?  
  
\*Chapter 1 Page 3-4
2. How will the results of your study lead to practical application?  
  
\*Chapter 1 Page 3-4
3. Briefly discuss your theoretical framework.\*  
  
Chapter 2 Page 6-Conceptual framework diagram  
Page 23- discussion
4. Discuss the validity and reliability of any instruments used in your study.\*  
  
Purpose of study is to establish validity and reliability of the instrument.
5. What are variables that may interfere with your study and how do you plan to control them?\*
- Subjects may not complete the third questionnaire 2 weeks after initial testing, therefore, data collection will continue until 35 subjects complete all questionnaires.
6. What are the limitations of your study?\*
- Patients have various knowledge levels regarding cardiac lifestyle changes. Unable to establish construct validity.
7. Describe your study population.\*  
  
\*Chapter 3 Page 24
8. How will your study population be affected by the policies and procedures of the specific unit at St. Joseph's Hospital and Medical Center? Will you be requesting a modification of procedures?  
  
No effect
9. If your study includes a patient population, what types of patients will be involved?  
  
Outpatient Cardiac Rehabilitation patients
10. How much time will you request from each individual patient/nurse to complete your study?  
  
Thirty minutes

NURSING RESEARCH COMMITTEE  
SUMMARY FORM

PAGE 2

11. Regarding data collection:

- a. Time of day? Before or after the patient's exercise session.
- b. Who will collect? The primary investigator.
- c. Time periods for collection? Mondays, Wednesday, Friday  
7 a.m. - 2 p.m.

12. How do you plan to get results of your study to those individuals involved?

Answers will be reviewed with patients following completion of all questionnaires.

13. Attach a copy of your informed consent form and confidentiality statement.

\*Attached

14. Was the proposal approved by a faculty person from your school?

See memorandum dated Oct. 17, 1984

\*If above answers are included in your proposal, please cite page number and attach proposal.

Approved: \_\_\_\_\_ Date: \_\_\_\_\_  
Committee Chairman

**APPENDIX D**

**DISCLAIMER**

**Instrument Development to Assess  
Knowledge of Lifestyle Changes**

**Investigator: Amelia Steinbinder R.N.      Home phone: 234-0523**

I am conducting a study as part of an educational requirement. I would like your participation by completing two questionnaires now and one questionnaire two weeks from now. The purpose of the study is to answer the following questions: 1) Does the questionnaire measure cardiac patients' knowledge of lifestyle changes and 2) Is the questionnaire accurate and clear. The questionnaire has been designed to identify what patients know about caring for themselves after they have had a heart attack.

You will be given two questionnaires; the first one is described above and the second one includes questions about your progress after your heart attack. The questionnaires will take about thirty minutes of your time to complete. Please answer the questions to the best of your ability. Two weeks from now a third questionnaire will be mailed to you. Please complete that questionnaire within forty-eight hours and return it in the enclosed stamped and self addressed envelope.

Your participation is voluntary and you may withdraw from the study at any time. Please ask any questions you may have. By completing the questionnaires there is no risk to you. The answers are strictly confidential and your name is not on the questionnaires. Your care by your doctor will not be affected in any way. The information will not be shared with your doctor or any other person. The information will only be shared with the researcher's thesis committee. Upon completion of the third questionnaire the answers will be reviewed with you if you so desire.

**Thank you for your participation!**

APPENDIX E

QUESTIONNAIRE II FOR CARDIAC EXPERTS







**SELFCARE SUBSCALE DEFINITIONS**

1. **Exercise and Activity Subscale-** Cardiac patients perform isotonic movements that benefit their cardiovascular systems. In addition, other movements are performed that are integral components of daily living. The cardiac patient must recognize optimal conditions prior to engaging in the movements. He must also recognize appropriate interventions that should be taken during the session to prevent injury. (AHA Committee Report, 1980)

2. **Smoking Subscale-** Cardiac patients should be aware of the health risks related to tobacco use and the benefits related to discontinuation of tobacco use. (AHA Committee Report, 1980)

3. **Hypertension-Scale-** High blood pressure is a cardiac risk factor that can be easily detected and treated to reduce harmful effects to the cardiovascular system. Cardiac patients should be able to identify measures to control blood pressure and the outcomes of untreated high blood pressure. (AHA Committee Report, 1980)

4. **Diet Subscale-** Foods containing cholesterol, sodium and saturated fat promote cardiovascular disease. Therefore, cardiac patients must be able to identify food content to avoid use or reduce consumption of items high in cholesterol, sodium and saturated fat. (AHA Committee Report, 1980)

5. **Cardiac Medication Subscale-** Cardiac patients must recognize the therapeutic effects as well as the potential side effects of prescribed drugs including nitroglycerin which is taken on a prn (as needed) basis. Individuals must understand indications for use and directions for use. Due to instability of nitroglycerin, individuals must know proper care of the drug. (AHA Committee Report, 1980)

6. Signs and Symptoms Subscale- Individuals who have sustained a myocardial infarction must be able to: a) recognize a variety of conditions, b) relay important subjective and objective data enabling a physician to intervene and c) take appropriate actions independently to reduce the chance of sustaining a serious event. (AHA Committee Report, 1980)

7. Stress Subscale- A phenomenon that causes physical as well as psychological reactions that can aggravate a cardiovascular event. Individuals should be able to identify signs of this phenomenon and best ways of reducing its effects. (AHA Committee Report, 1980)

**Directions.** There are thirty-nine items in this questionnaire. Please read each item carefully and circle the letter of the correct answer. Remember, only one answer is correct for each question.

1. If you develop chest pain, shortness of breath, fatigue, dizziness, or a pounding heart sensation during an activity:

- A) finish the activity, then rest
- B) call your doctor immediately
- C) stop the activity and rest
- D) finish the activity at a slower pace

2. Exercises that are safe during the first six weeks after hospital discharge include:

- A) pushups
- B) jogging
- C) walking
- D) weight lifting

3. Which cheese has the lowest fat content?

- A) mozzarella
- B) cheddar cheese
- C) swiss cheese
- D) blue cheese

4. The meat with the lowest fat content is:

- A) liverwurst
- B) salami
- C) bologna
- D) boiled ham

5. What is the risk of a smoker having another heart attack in comparison to a nonsmoker?
- A) If a smoker quits, his risk always remains greater than a nonsmoker
  - B) If a smoker cuts down to less than  $\frac{1}{2}$  pack per day, his risk will be the same as a nonsmoker
  - C) If a smoker does not inhale, his risk is the same as a nonsmoker
  - D) If a smoker quits, his risk is the same as a nonsmoker after five years
6. If a smoker stops smoking he will reduce the likelihood of both:
- A) gum disease and heart attacks
  - B) stomach ulcers and skin cancer
  - C) kidney disease and throat cancer
  - D) lung cancer and strokes
7. A person who has high blood pressure should:
- A) have a yearly eye exam and avoid unnecessary stress
  - B) smoke to reduce stress and take prescribed medications
  - C) avoid unnecessary stress and restrict all physical activity
  - D) restrict all physical activity and have a yearly eye exam
8. A person with high blood pressure must take prescribed medication:
- A) for the rest of his life
  - B) until his blood pressure is lowered
  - C) until he feels better
  - D) only when he feels tense

9. The common signs of a heart attack are:
- A) shortness of breath and chest pain
  - B) cramps and shortness of breath
  - C) sweating and leg discomfort
  - D) cramps and weakness
10. If you begin to experience chest pain that occurs with minimal activity or begins to occur more frequently:
- A) contact your physician
  - B) wait until your next physician appointment
  - C) decrease your activity
  - D) increase your medications
11. Activities that are considered safe during the first 2-3 weeks after hospital discharge are:
- A) riding in a car or walking on level ground
  - B) digging in the garden or going back to work
  - C) mowing the grass or playing golf
  - D) going on a long trip or playing tennis
12. In resuming sexual relations it is advisable to have sex:
- A) after a meal
  - B) when you feel rested
  - C) after an alcoholic beverage
  - D) even though you are upset or angry
13. In reading an ingredient label on a margarine container, it is desirable to choose a margarine with which item listed first?
- A) hydrogenated oil
  - B) liquid vegetable oil
  - C) partially hydrogenated oil
  - D) palm oil

14. Polyunsaturated fats are recommended on a low fat diet, which of the following is an example?

- A) coconut oil
- B) corn oil
- C) palm oil
- D) olive oil

15. Which statement is true about nitroglycerin?

- A) one tablet should provide quick relief within three to five minutes
- B) a pounding headache is not a common side effect of nitroglycerin
- C) dizziness or faintness after taking a nitroglycerin is an allergic reaction
- D) nitroglycerin taken before an activity does not prevent angina

16. Which statement is true about quitting smoking?

- A) quitting is difficult due to the mental and physical addiction
- B) quitting "cold turkey" means a smoker will never smoke again
- C) failing to quit in the past means a smoker will never quit
- D) reducing the number of cigarettes smoked each day is an effective method to quit

17. Uncontrolled high blood pressure can lead to:

- A) a stroke
- B) weight gain
- C) stress
- D) stomach problems

18. Harmful stress can be controlled by:
- A) ignoring stressful situations
  - B) sleeping eight hours each night
  - C) developing coping skills
  - D) taking tranquilizers
19. If chest pain is severe and unrelieved by nitroglycerin, you should:
- A) walk so the pain will go away
  - B) sit down and relax
  - C) wait 20 minutes so the pain will go away
  - D) call the paramedics or emergency squad
20. If you are experiencing anginal pain, what should you do before calling your physician?
- A) Take as many nitroglycerin as needed until the pain subsides
  - B) Take one nitroglycerin every 5 minutes until the pain subsides
  - C) Take one nitroglycerin every 3-5 minutes until four are taken
  - D) Take as many nitroglycerin as needed during a 15 minute period
21. Before your exercise session (walk) you may:
- A) smoke a cigarette
  - B) drink alcoholic or caffeinated beverages
  - C) eat two hours before exercising
  - D) eat a heavy meal one hour before exercising

22. The amount of body energy required to do activities using the arms is:
- A) the same as activities using only the legs
  - B) greater than those activities using the legs
  - C) uncomparable to activities using the legs
  - D) less than activities using only the legs
23. Which food should be restricted the most when you are controlling cholesterol (blood fat) levels?
- A) red meat
  - B) egg yolks
  - C) egg whites
  - D) cheese
24. Nitroglycerin should be taken by:
- A) swallowing the tablet without water
  - B) chewing the tablet followed by drinking water
  - C) putting the tablet under the tongue
  - D) swallowing the tablet with water
25. Care of nitroglycerin includes:
- A) carrying a bottle of nitroglycerin in a pocket closest to your body heat
  - B) replacing nitroglycerin 6 months-1 year because it loses its potency
  - C) keeping nitroglycerin in a warm light place
  - D) replacing nitroglycerin every 2 years because it loses its potency
26. Nicotine effects the heart by:
- A) slowing down the heart rate
  - B) speeding up the heart rate
  - C) reducing the work of the heart
  - D) lowering the blood pressure

27. High blood pressure can be detected by:
- A) frequent headaches
  - B) excessive nervousness
  - C) a blood pressure cuff
  - D) a fast pulse
28. Stress affects the heart by:
- A) increasing the heart rate
  - B) decreasing the heart rate
  - C) decreasing the blood pressure
  - D) reducing the work of the heart
29. Which statement is true about stress?
- A) It always has a negative effect on the body
  - B) It can best be controlled by medication
  - C) It affects only those working in executive positions
  - D) It is a risk factor contributing to heart disease
30. Notify your physician if which of the following two symptoms occur:
- A) ankle swelling and a 2 pound weight gain
  - B) increased appetite and shortness of breath
  - C) a 2 pound weight gain and increased appetite
  - D) lower back pain and ankle swelling
31. Walking is a good form of exercise and should be performed:
- A) outdoors when the temperature is higher than 90 degrees
  - B) up a hill
  - C) after completing household activities
  - D) on a flat surface

32. The best selection of low salt foods are:
- A) lunch meat and hot dogs
  - B) bacon and ham
  - C) smoked fish and ocean fish
  - D) turkey and chicken
33. How often can red meat be eaten?
- A) one meal a day
  - B) as often as desired
  - C) one meal a week
  - D) three or four meals a week
34. You will know that your nitroglycerin is still active if:
- A) a slight stinging sensation occurs when the tablet is in your mouth
  - B) the tablet remains white and does not change color
  - C) the tablet is in one piece before you put it in your mouth
  - D) there really is no way to check
35. Which statement is true about heart medications?
- A) If you feel good, you may stop taking medications
  - B) If you forget to take a pill, take two the next time
  - C) If you feel worse, reduce the dose
  - D) If you are vomiting, and unable to take medications, call your doctor

36. Which statement is true about smoking?
- A) Smoking is safe if it is a person's only risk factor
  - B) Cigarette smoke is harmful to the smoker and to those around him
  - C) Pipe and cigar smoking is safe because a person does not inhale
  - D) Cigarettes with filters are safe because the harmful components are trapped in the filter
37. High blood pressure can best be controlled or lowered by:
- A) sleeping 8 hours each night and quitting smoking
  - B) losing weight and restricting fluid intake
  - C) accepting life and self discipline
  - D) exercising regularly and losing weight
38. A person is described as prone to having a heart attack if he exhibits the following behaviors:
- A) competitive and impatient
  - B) aggressive and relaxed
  - C) ambitious and impatient
  - D) work oriented and passive
39. The inability to handle stress can best be identified by the following:
- A) trouble sleeping and a relaxed, calm approach
  - B) eating or drinking to relieve tension and frequent headaches
  - C) depression and ability to think logically
  - D) a relaxed, calm approach and frequent headaches

APPENDIX F

REVISED QUESTIONNAIRE AND KEY

## QUESTIONNAIRE

**DIRECTIONS.** There are thirty-nine items in this questionnaire. Please read each item carefully and circle the letter of the correct answer. Remember, only one answer is correct for each question.

1. If you develop chest pain, shortness of breath, fatigue, dizziness, or a pounding heart sensation during an activity:

- A) finish the activity, then rest
- B) call your doctor immediately
- C) stop the activity and rest
- D) finish the activity at a slower pace

2. An exercise that is safe during the first six weeks after hospital discharge is:

- A) pushups
- B) jogging
- C) walking
- D) weight lifting

3. Which cheese has the lowest fat content?

- A) mozzarella
- B) cheddar cheese
- C) swiss cheese
- D) bleu cheese

4. The meat with the lowest fat content is:

- A) liverwurst
- B) salami
- C) bologna
- D) boiled ham

5. What is the risk of a smoker having another heart attack in comparison to a nonsmoker?

- A) If a smoker quits, his risk always remains greater than a nonsmoker
- B) If a smoker cuts down to less than 1/2 pack per day, his risk will be the same as a nonsmoker
- C) If a smoker does not inhale, his risk is the same as a nonsmoker
- D) If a smoker quits, his risk is the same as a nonsmoker after five years

6. If a smoker stops smoking he will reduce the likelihood of both:

- A) strokes and heart attacks
- B) stomach ulcers and skin cancer
- C) kidney disease and throat cancer
- D) lung cancer and diabetes

7. A person who has high blood pressure should:

- A) have a yearly eye exam and avoid unnecessary stress
- B) smoke to reduce stress and take prescribed medications
- C) avoid unnecessary stress and restrict all physical activity
- D) restrict all physical activity and have a yearly eye exam

8. A person with high blood pressure must take prescribed medication:

- A) for the rest of his life
- B) until his blood pressure is lowered
- C) until he feels better
- D) only when he feels tense

9. The common signs of a heart attack are:

- A) shortness of breath and chest pain
- B) cramps and shortness of breath
- C) sweating and leg discomfort
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10. If you begin to experience chest pain that occurs with minimal activity or begins to occur more frequently:

- A) contact your physician
- B) wait until your next physician appointment
- C) decrease your activity
- D) increase your medications

11. Activities that are considered safe during the first 2-3 weeks after hospital discharge are:

- A) riding in a car or walking on level ground
- B) digging in the garden or going back to work
- C) mowing the grass or playing golf
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12. In resuming sexual relations it is advisable to have sex:

- A) after a meal
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- C) after an alcoholic beverage
- D) even though you are upset or angry

13. In reading an ingredient label on a margarine container, it is desirable to choose a margarine with which item listed first?

- A) hydrogenated oil
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14. Polyunsaturated fats are recommended on a low fat diet. Which of the following is an example?

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- D) taking tranquilizers

19. If chest pain is severe and unrelieved by nitroglycerin, you should:

- A) walk so the pain will go away
- B) sit down and relax
- C) wait 20 minutes so the pain will go away
- D) call the paramedics or emergency squad

20. If you are experiencing anginal pain, what should you do before calling for emergency assistance?

- A) Take as many nitroglycerin as needed until the pain subsides
- B) Take one nitroglycerin every 5 minutes until the pain subsides
- C) Take one nitroglycerin every 3-5 minutes until four taken
- D) Take one nitroglycerin every minute until the pain subsides

21. Before your exercise session (walk) you may:
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  - C) eat two hours before exercising
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  - C) ambitious and patient
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  - B) eating or drinking to relieve tension and frequent headaches
  - C) depression and ability to think logically
  - D) a relaxed, calm approach and frequent headaches

## KEY TO REVISED QUESTIONNAIRE

Item	Correct Answer	Subscale	Item	Correct Answer	Subscale
1	C	Activity	21	C	Activity
2	C	Activity	22	B	Activity
3	A	Diet	23	B	Diet
4	D	Diet	24	C	Medications
5	D	Smoking	25	B	Medications
6	A	Smoking	26	B	Smoking
7	A	Blood Pressure	27	C	Blood Pressure
8	A	Blood Pressure	28	A	Stress
9	A	Signs	29	D	Stress
10	A	Signs	30	A	Signs
11	A	Activity	31	D	Activity
12	B	Activity	32	D	Diet
13	B	Diet	33	D	Diet
14	B	Diet	34	A	Medications
15	A	Medications	35	D	Medications
16	A	Smoking	36	B	Smoking
17	A	Blood Pressure	37	D	Blood Pressure
18	C	Stress	38	A	Stress
19	D	Signs	39	B	Stress
20	C	Signs			

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