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Influences of coronary artery disease knowledge, anxiety, social support, and self-efficacy on adaptive health behaviors of patients treated with a percutaneous transluminal coronary angioplasty.

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INFLUENCES OF CORONARY ARTERY DISEASE KNOWLEDGE, ANXIETY, SOCIAL SUPPORT, AND SELF-EFFICACY ON ADAPTIVE HEALTH BEHAVIORS OF PATIENTS TREATED WITH A PTCA

by

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A DISSERTATION

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ABSTRACT OF DISSERTATION
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Title Influences of Coronary Artery Disease Knowledge, Anxiety, Social Support, and Self-Efficacy on Adaptive Health Behaviors of Patients Treated With A PTCA

The purpose of this study was to determine if there was a significant relationship among coronary artery disease (CAD) knowledge, anxiety, social support, and self-efficacy and the adaptive health behaviors of diet, exercise, and smoking for patients treated with a percutaneous transluminal coronary angioplasty (PTCA). The Roy Adaptation Model served as the conceptual framework. Bandura's Social Cognitive Theory was used to hypothesize an influence of self-efficacy on adaptive lifestyle changes.

A convenience sample of 82 first-time PTCA patients was included in this study. Instruments utilized included a demographic form, the Coronary Angioplasty Risk Factor Inventory (Murphy, & Fishman, & Shaw, 1989), the State-Trait Anxiety Inventory (Form Y) (Spielberger, 1983), the Cardiac Diet Self-Efficacy Instrument (Hickey, Owens, & Froman, 1992), the Cardiac Exercise Self-Efficacy Instrument (Hickey et al.), the Self-Efficacy for Smoking Avoidance

Instrument (DiClemente, 1981), the University of Alabama at Birmingham (UAB) Food Frequency Checklist, an exercise frequency checklist, and an interview form.

Data were analyzed using descriptive statistics, correlations, factor analysis, t tests, stepwise multiple regression, and canonical correlation. Results indicated that the four predictive variables of CAD knowledge, anxiety, social support, and self-efficacy all had an influence on one or more of the adaptive health behaviors of diet modification, exercise, and smoking. Self-efficacy was the single most predictive variable that was consistently related to adaptive behavior. Anxiety in combination with self-efficacy was found to have the most significant relationship with change in the subjects' adaptive behaviors.

Implications of this study include: (a) use of screening procedures to identify anxiety and self-efficacy levels in patients treated with a PTCA, (b) nursing care focused on lowering patients' anxiety while increasing their self-efficacy, and (c) qualitative studies to identify patients' perceptions of reasons for adaptive or ineffective health behaviors after a PTCA.

Abstract Approved by: Committee Chairman Anne J. Foote

Program Director Carol Dashiff

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CHAPTER I

Introduction

Cardiovascular disease is the leading cause of death in Americans, causing nearly half of all deaths in 1993. Coronary artery disease (CAD) accounted for nearly one half of these deaths (American Heart Association, 1993). Individuals with CAD frequently undergo percutaneous transluminal coronary angioplasty (PTCA) to treat this problem. This procedure may temporarily correct the problem, but it does not alter the causative factors of CAD. Management of the progression of CAD requires changes in a person's health behavior. Social support and self-efficacy have been demonstrated to have effects on adaptive behaviors associated with healthy lifestyle changes (Broadhead et al., 1983).

Statement of the Problem

Patients with CAD are faced with the physical and psychological stress of adaptation to a chronic illness and alteration in lifestyle. Adherence to medical recommendations can be problematic (Redeker, 1988); data have demonstrated that patient compliance with recommended treatment of chronic disease is low. It has been estimated that approximately one third of patients adhere to medical

regimens (Becker, 1985). Patients with CAD who have undergone PTCA have had to make decisions regarding medical recommendations that would include adaptive health behaviors.

Research findings indicate that social support may aid in recovery from hospitalizations, surgery, and illness, and also assist with coping during times of psychological and physical stress (Broadhead et al., 1983; Cobb, 1976; Stewart, 1989). Hamburg and Killilea (1979) noted in their report to the Surgeon General that "the medical care system could more effectively serve its societal function if the relationship between life stress, illness, patient behavior, and social support systems was better understood" (p. 255).

It has been demonstrated that the spouse is the most supportive person for the CAD patient (O'Reilly & Thomas, 1989). Dealing with CAD is also a stressful time for spouses. It has also been documented that, postoperatively, spouses of CAD patients report higher subjective stress than patients (Gilliss, Neuhaus, & Hauck, 1990).

Bandura proposes that a person's belief in his capabilities (self-efficacy) affects his motivation, behavior, and thought processes. Anxiety may influence a person's perceptions, as well as knowledge about how to perform tasks. If a person has a strong belief in his capabilities, the greater and more persistent are his efforts (Bandura, 1989). Riffle (1988) found that increasing knowledge through planned teaching resulted in

wives feeling that they were better able to handle long-term implications associated with CAD.

In the present study, measurement of CAD knowledge, anxiety, social support, and self-efficacy associated with adaptive changes after a PTCA is one way to assess for the need for specific nursing interventions. Although it may or may not be possible to alter the positive or negative influence of some of these variables, knowledge of their presence and impact is important to plan individualization of nursing interventions. Therefore, the problem statement is: What influences do CAD knowledge, anxiety, social support, and self-efficacy have on adaptive health behaviors of patients treated with a PTCA?

Assumptions

The following principles were accepted as true in this study: (a) CAD knowledge, anxiety, social support, and self-efficacy had been measured, (b) information obtained from medical records was accurate.

Limitations

The following limitations were identified for this study.

1. A convenience sample from one site was used, that may have allowed for bias in the findings. If randomization of the sample had been used, fewer subjects would have been included in the study, reducing the number of subjects. Due to the number of variables examined, it was important to have a large number of subjects.

2. The questionnaires were read by the investigator, which may have introduced a methodological bias due to the investigator's affect or body language.

3. The study was limited by the ability of the subjects to recall their behavior and/or record it accurately.

4. The subjects may not be accurate and/or willing to report their actual behavior if it has not changed after a PTCA.

5. Other intervening physiological and psychological variables may have occurred influencing adaptation.

6. The passage of time, and physical and psychological changes in subjects, may have affected the results by causing alterations in adaptive health behaviors.

7. Previous experience with questionnaires may influence responses and affect the validity of the data.

8. This study examines CAD knowledge only, which may be influenced by the IQ of the subjects. IQ was not controlled in this study.

9. There are other sources of social support within the patient's social network, but the present study is designed primarily to examine the spouse or significant other who usually is the primary support person (Bramwell, 1986; Stanley & Frantz, 1988).

10. Valid instruments to evaluate diet and exercise were not found for this study. Steps were taken to establish validity for these outcome measurements. These

measurements were not trying to infer a trait, as an abstraction that uses reliability statistics. If subjects exercised, they exercised, and it was not necessary to infer a trait of exercise. It was felt the exercise had a validity above any inferential trait of exercise.

11. The small sample size limits the significance of factor analysis and canonical correlation. These measures provide support for other statistical measures.

Purpose

The purpose of this research was to determine the influences CAD knowledge, anxiety, social support, and self-efficacy have on adaptive health behaviors of CAD patients treated with a PTCA.

Subjects experiencing their first PTCA were studied after the procedure while still hospitalized and then 6 to 8 weeks following the procedure to answer the following research question: Does CAD knowledge, anxiety, social support, and self-efficacy influence adaptative health behaviors of patients 6 to 8 weeks post-PTCA?

Definitions

The following terms were defined for the purpose of this study.

Anxiety: an unpleasant emotional state proportional to the magnitude of the perceived danger that evoked it (Spielberger, 1966). Anxiety has two components: trait anxiety, which is the anxiety a person generally feels; and state anxiety, which is how a person perceives stress at a

particular time. State anxiety may vary in intensity and fluctuate over time due to the amount of stress that impinges on the individual (Spielberger, 1983). Anxiety is operationally defined as the person's score on the State-Trait Anxiety Inventory (STAI), Form Y (Y-1 = state anxiety, Y-2 = trait anxiety) by Spielberger (1983).

CAD Knowledge: a person's knowledge of CAD risk factors. Operationally, CAD knowledge is defined as a score on the Coronary Angioplasty Risk Factor Inventory, Form 3 (Murphy et al., 1989).

Social Support: an individual's perception of interpersonal transactions provided by their spouse or significant other, which includes one or more of the following: (a) emotional support (expressions of liking, admiration, respect, or love), (b) information (expressions of agreement or acknowledgement of the appropriateness or rightness of some act or statement of another person), and (c) tangible assistance (physical chores, money, time, and things). Operationally, social support is defined as the score on the Perceived Support Inventory (Version A) (Yates, 1989).

Self-Efficacy: a person's judgment of his own capability to accomplish certain tasks (Bandura, 1986). Operationally, self-efficacy is defined as the scores on the Cardiac Diet Self-Efficacy Instrument (CDSEI), the Cardiac Exercise Self-Efficacy Instrument (CESEI)

(Hickey et al., 1992), and the Self-Efficacy for Smoking Behavior (DiClemente, 1981).

Adaptive Health Behavior: "responses that promote integrity in terms of the goals of the human system" (Roy & Andrews, 1991, p. 4). Operationally, this is defined as a score on the UAB Food Frequency Checklist, patient reports of the their smoking habits, and data recorded on the patient's exercise frequency checklist.

Ineffective Health Behavior: "responses that do not contribute to integrity in terms of goals of the human system" (Roy & Andrews, 1991, p. 4). Operationally, this is defined as data on the UAB Food Frequency Checklist, patient reports of their smoking habits, and data recorded on the exercise frequency checklist.

Conceptual Framework

The Roy Adaptation Model

Roy views the person as a "holistic, adaptive system" (Roy & Andrews, 1991, p. 29). Roy's (1988) assumptions are associated with the two philosophic principles of humanism and veritivity. Humanism "recognizes the person and subjective dimensions of human experience as central to knowing and to valuing" (Roy, 1988, p. 29). One assumption in humanism is "that the individual...strives to maintain and to realize the need for relationships" (Roy, 1988, p. 32). The assumptions provide the basis for the major concepts in Roy's model--the person as an adaptive system

with adaptive modes, environment, health, and nursing (Roy & Andrews, 1991).

The model depicts health as a dynamic concept and as a reflection of a person's adaptation. Health is defined as "a state and a process of being and becoming integrated and whole" (Roy & Andrews, 1991, p. 19).

Environment is the second major concept in the Roy Adaptation Model. Environment includes "all conditions, circumstances, and influences that surround and affect the development and behavior of the person" (Roy & Andrews, 1991, p. 18). The influencing factors are called stimuli. There are three general classes of stimuli: focal stimulus, which is the internal or external stimulus confronting the person and attracting his attention; contextual stimuli, which includes all other stimuli present in the situation contributing to the effect of the focal stimulus; and residual stimuli or factors whose effects in the current situation are unclear but are relevant to the situation (Roy & Andrews, 1991). An adaptive response to stimuli is one that "promotes the integrity of the person in terms of the goals of adaptation, survival, growth, reproduction, and maturity" (Roy & Andrews, 1991, p. 12).

An ineffective response is one that "neither promotes integrity nor contributes to the growth of adaptation" (Roy & Andrews, 1991, p. 12). Adaptation to stimuli is accomplished by coping mechanisms within the person that are innate or acquired. These coping mechanisms are categorized

into two major subsystems, the regulator subsystem and the cognator subsystem. The regulator subsystem is a physiological process that responds automatically through neural, chemical, and endocrine processes. The cognator subsystem facilitates coping through psychosocial processes of "perceptual/ information processing, learning, judgment and emotion" (Roy & Andrews, 1991, p. 14). The person's behavior that occurs as a result of these two subsystems can be observed in the four adaptive modes developed by Roy.

The third major concept is the person as an adaptive system with adaptive modes. The four adaptive modes are the physiological mode, the self-concept mode, the role function mode, and the interdependence mode. The physiological mode involves five basic physiological needs (oxygenation, nutrition, elimination, activity and rest, and protection) and four regulator processes (senses, fluid and electrolytes, neurological function, and endocrine function). The second adaptive mode is self-concept. According to Roy, self-concept is "the composite of beliefs and feelings that the person holds about him or herself at a given time" (Roy & Andrews, 1991, p. 16). Psychic integrity is the basic need underlying the self-concept mode. The third adaptive mode is role function. In this mode the focus is on the roles a person occupies in society. The need underlying this mode is social integrity. Anxiety may affect a person's ability to function in his role. Finally, the last mode of adaptation is the interdependence mode,

which focuses on interaction related to giving and receiving of love, respect, and value. The primary focus of this mode is affectional adequacy. Although these modes are frequently viewed separately, they are all interrelated and behavior in one mode may act as a stimulus in another mode (Roy & Andrews, 1991). The concepts utilized in Roy's model, as they apply to a healthy individual, are illustrated in Figure 1.

The final concept is nursing. Roy describes the role of nursing in health care as promotion of health in individuals and in society. The goal of nursing is "the promotion of adaptation in each of the four modes, thereby contributing to the person's health, quality of life, and dying with dignity" (Roy & Andrews, 1991, p. 20).

The nursing process is utilized for first-level assessment or collection of data regarding the person's internal and external behavior. The nurse then decides whether the behavior "is of concern to the nurse and/or the person...and whether the behavior is adaptive or ineffective" (Roy, 1984, p. 49). In second level assessment the nurse assesses factors (stimuli) that influenced ineffective behavior. Analysis of the data is then used to formulate a nursing diagnosis, set goals, perform interventions, and evaluate the effectiveness of the interventions in relation to the patient's behavior (Roy & Andrews, 1991). The Roy Adaptation Model as applied to a person receiving nursing care is depicted in Figure 2.

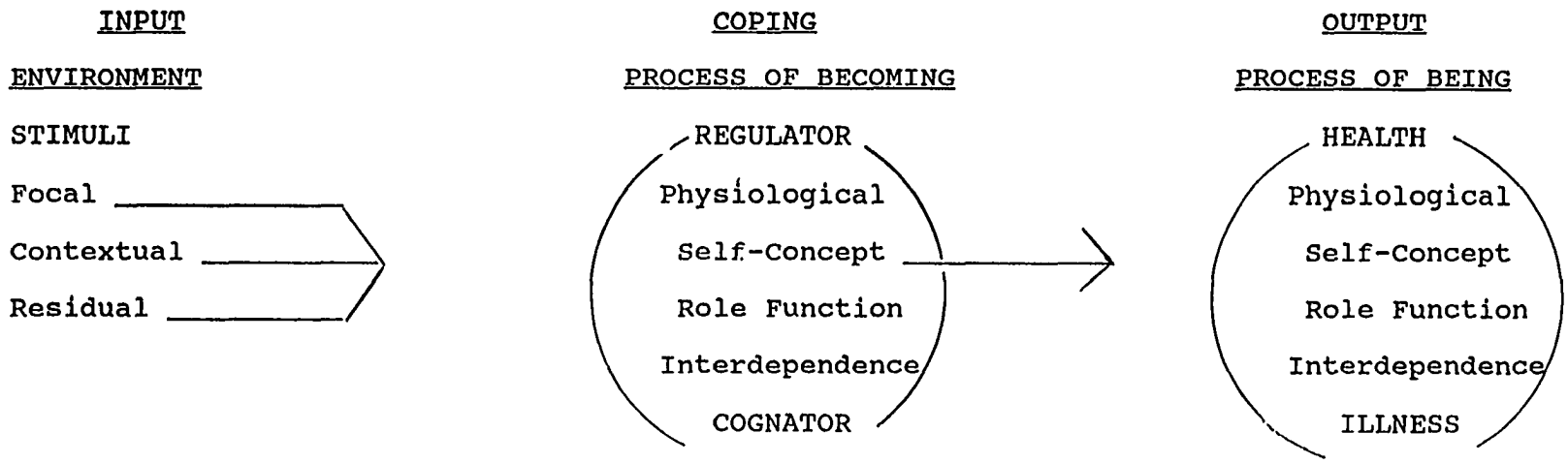

Figure 1. Adapted from Roy's Adaptation Model of a healthy person.

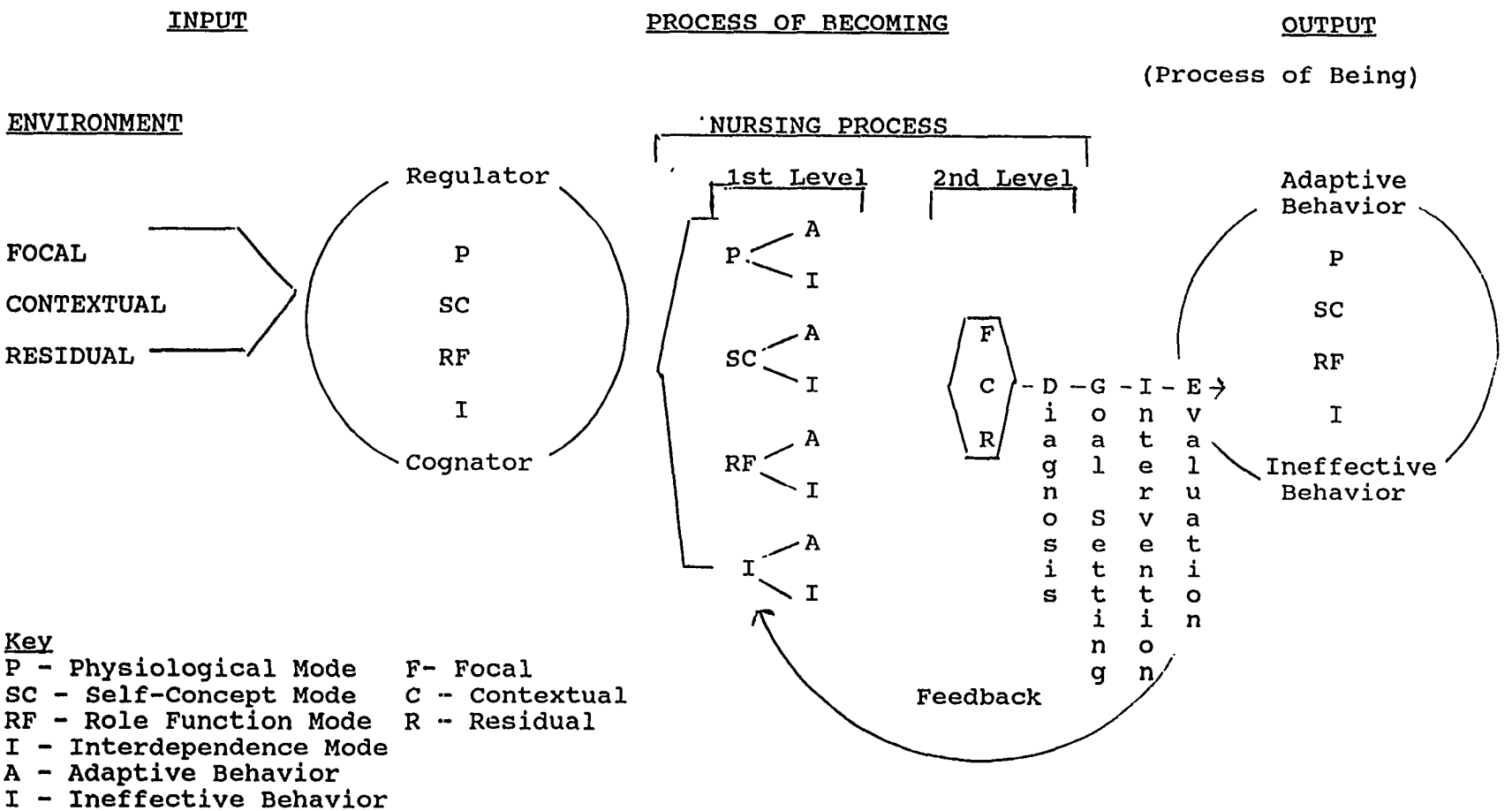

Figure 2. Adapted from Roy's Adaptation Model of a person receiving nursing care.

Social Cognitive Theory

Bandura's social cognitive theory was first presented by Bandura and Walters (1963) as a social learning theory. His theory views human functioning as a reciprocal concept by which people influence their environment, which in turn influences the way they behave. The relative influence of behavior, personal factors, and environmental factors differs in various settings, activities, and circumstances. There are also times when one factor is more powerful than another factor in controlling actions (Bandura, 1977; Bandura, 1986).

> Bandura reminds the reader that in social cognitive theory, perceived self-efficacy operates as one common mechanism of behavioral change--different modes of influence alter coping behavior partly by creating and strengthening self-percepts of efficacy. This does not mean that other mechanisms do not also come into play in promoting change. (1986, p.425)

The propositions of Bandura's (1989) self-efficacy theory are:

1. Exercise of agency occurs through self-belief of efficacy. Self-efficacy is defined as "people's beliefs about their capabilities to exercise control over events that affect their lives" (Bandura, 1989, p. 1175). The following four processes determine this belief. The first process is the cognitive processes, which takes place when self-efficacy beliefs affect thought patterns. The stronger a person's perceived self-efficacy, the higher the goals a person sets for oneself and the more firmer the commitment to them. The second process is the motivational process

which takes place when a person's self-efficacy beliefs determine his level of motivation, which is reflected by the effort exerted and how long he persists in the face of obstacles. The stronger the belief in his capabilities, the greater and more persistent are his efforts. The third process is the affective process which takes place when a person's beliefs in his capabilities affect how much stress and depression he experiences in threatening or taxing situations, as well as his level of motivation. A person who believes he has control over potential threats does not become apprehensive and perturbed by them. The fourth process is the selection process which takes places when a person has some influence over his life course by selection of environment and construction of environment. A person tends to avoid activities and situations that he believes exceeds his coping capabilities, but readily undertakes activities and selects social environments he feels he is capable of handling.

2. Exercise of agency occurs through goal representation. This is the capacity of forethought. A person anticipates the likely consequences of his actions, sets a goal for himself, and plans his course of action, which is likely to produce the desired outcomes. By using forethought and self-regulation he motivates himself and plans his course of action, which is likely to produce the desired outcome. By using forethought and self-regulation he motivates himself and guides his actions anticipatorily.

3. Exercise of agency occurs through anticipated outcomes. This is the ability to envision the likely outcomes of prospective actions through anticipatory mechanisms regulating human motivation and action. The type of outcomes a person anticipates depends largely on his beliefs about how well he will be able to perform in a given situation.

Bandura (1986) postulates that individuals' perceptions of their capabilities affect their motivations, their behaviors, their thought processes, and their emotional reactions in threatening situations. If individuals do not think that they can perform the activities, then their behaviors will not be influenced (Bandura, 1989).

Bandura (1986) suggests that these beliefs develop from cognitive appraisal of information obtained from four major sources:

1. Physiological cues are indicators of energy, strength and stamina, such as fatigue or chest pain. Such beliefs about physical state could be modified with a PTCA.

2. Social persuasion occurs when the opinion of others, especially those in authority or identified as knowledgeable, can be used to influence confidence. Information used in health teaching can assist patients recovering from a PTCA.

3. Modeling occurs when personal beliefs are formed by comparing one's situation with others at the same skill or knowledge level. Success of others in accomplishing the

desired tasks and activities enhances the observer's beliefs in his capabilities. A spouse or significant other's increased knowledge of CAD risk factors and understanding of diet and exercise prescriptions may influence the patient.

4. Mastery is the most powerful source of efficacy information in enhancing self-beliefs is a person's ability to perform an activity or behavior after repeated trials. Successful attempts of practicing such healthy lifestyle behaviors as not smoking, exercising regularly, and following a reduced-risk diet reinforce continuation of these behaviors.

Social Support

Numerous studies have linked social support with adaptation associated with health and illness. Research findings show that social support may play a major role in modifying the deleterious effects of stress (Flannery & Wieman, 1989; Thoits, 1982), in influencing the use of health services, and in promoting health and restoration (Broadhead et al., 1983). Broadhead et al. (1983), in their review of literature, identified 11 characteristics of the association between social support and health. Some of these characteristics include: (a) a positive social support effect regardless of age, race, culture, or health status, but with a greater effect in women than in men; (b) poor social support precedes adverse psychological outcomes in mortality, while positive social support improves

physical and psychological outcomes; and (c) the dynamic nature of social support.

Schaefer, Coyne, and Lazarus (1981) examined the three types of perceived social support--tangible, emotional, and informational--in relation to stressful life events, psychological symptoms, morale, and physical status. Low tangible support and emotional support were independently related to depression and negative morale, while emotional support was associated with positive morale. Social support was not associated with physical health, pointing out the multidimensionality of social support and the difficulty in relating this concept to adaptive outcomes.

The examination of social support within the family has identified positive benefits associated with the support (Wellman & Wortley, 1989; Zastowny & Lewis, 1990; Zelkowitz, 1987). Dean, Kolody, and Wood (1990) noted that spouses, friends, and adult children were found to provide social support in descending order to depressed elderly persons. Kurdek's (1989) research data supported the position that social support, especially from spouses, can buffer the negative effects of stress.

Synthesis of the Elements of the Framework

When examining the adaptation of patients to the focal stimulus of PTCA, the importance of the individuals' social relationships and their ability to help them adapt becomes apparent. The interdependence is defined as "the close relationship of people" (Roy & Andrews, 1991, p. 386) with

the purpose of achieving affectional adequacy. "Affectional adequacy is the feeling of security in nuturing relationships....It includes the person's needs for care and attention, affirmation, belonging, approval, and understanding" (Roy & Andrews, 1991, p. 386-387).

Roy's Adaptation Model will be used to assess the person interacting with the contextual stimuli of significant others (SO) and support systems (SS) resulting in the output of adaptation or ineffective behavior. Roy and Andrews (1991) describe significant others and support systems as the relationships that provide affectional adequacy. "A significant other is the individual to whom the most meaning or importance is given" (Roy & Andrews, 1991, p. 387). Support systems are distinguished from significant others by definition and the intensity and meaning of the relationship to the person.

Roy's model was used to hypothesize that the interaction of the patient with the focal stimulus of PTCA results in the output of either adaptive or ineffective behavior. The contextual stimulus of significant others was hypothesized to positively influence adaptive behavior, resulting in adaptive lifestyle changes. Bandura's Social Cognitive Theory was used to hypothesize an influence of self-efficacy on adaptive lifestyle changes. The relationship between social support and self-efficacy on adaptive health behaviors of the patient will be examined. The links between components of Roy's Adaptation Model,

social support, and Bandura's Social Cognitive Theory are depicted in Figure 3.

In Figure 4, PTCA is identified as the focal stimulus. Background data (age, sex, race, marital status, education, occupation, previous admission to the hospital and/or coronary care unit, and risk factors for CAD), previously diagnosed heart conditions, PTCA or coronary artery bypass graft (CABG), social support, and the patient's self-efficacy were considered contextual stimuli. Residual stimuli include completion of early developmental tasks, awareness of affectional needs, interactional skills, level of self-esteem, nuturing ability, chronic illness, and mastery of previous challenging tasks and stressful situations. Awareness of affectional needs and interactional skills as residual stimuli was considered to have a direct impact on giving and receiving behaviors, because these relate most closely to interactional skills necessary between the patient and spouse or significant other. Residual stimuli cannot be measured and therefore were not examined in this research study. Giving and receiving behaviors were identified as supportive measures of informational support (understanding, affirmation), emotional support (touching, sharing jobs, body language), and tangible services (care). Adaptive or ineffective behavior, as the output, was identified by the patient's reported self-efficacy of his ability to cope through utilization of giving and receiving behaviors. First level

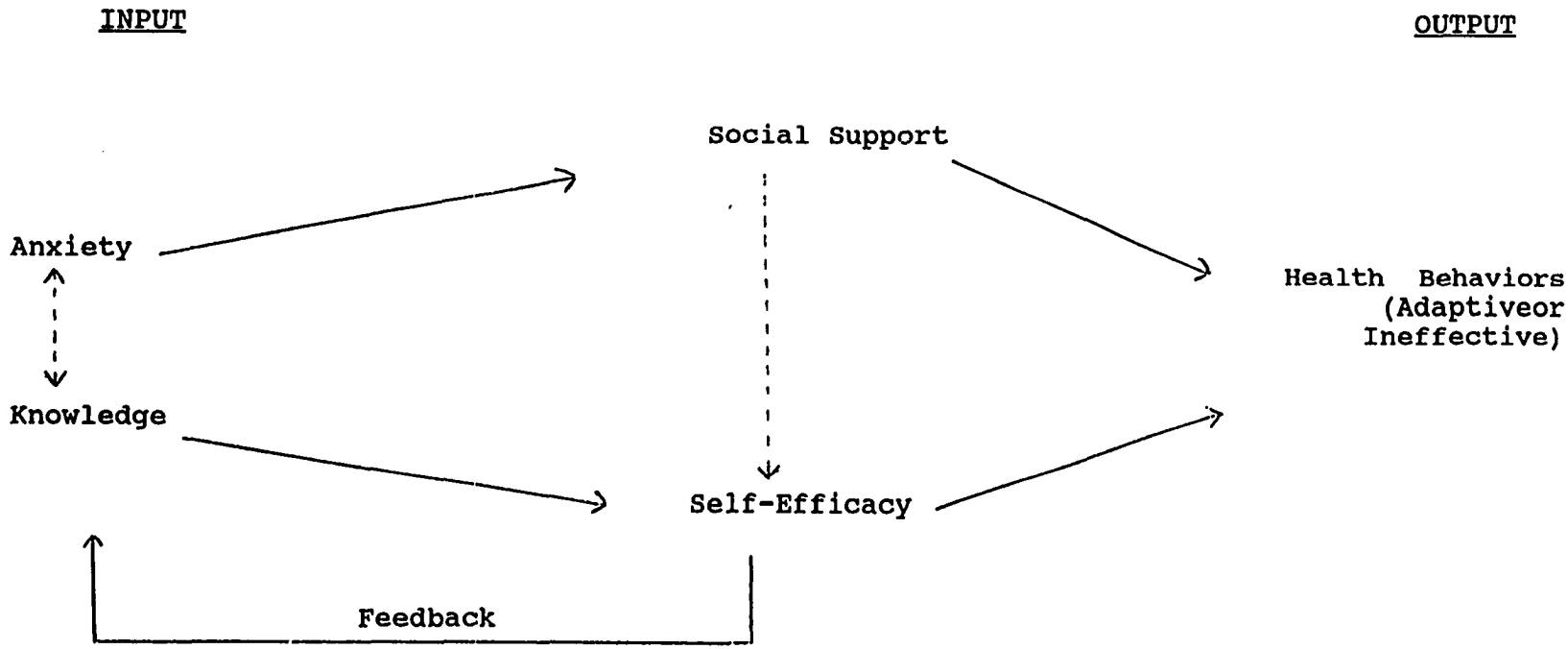

Figure 3. Links between the Roy Adaptation Model, social support, and Bandura's Social Cognitive Theory.

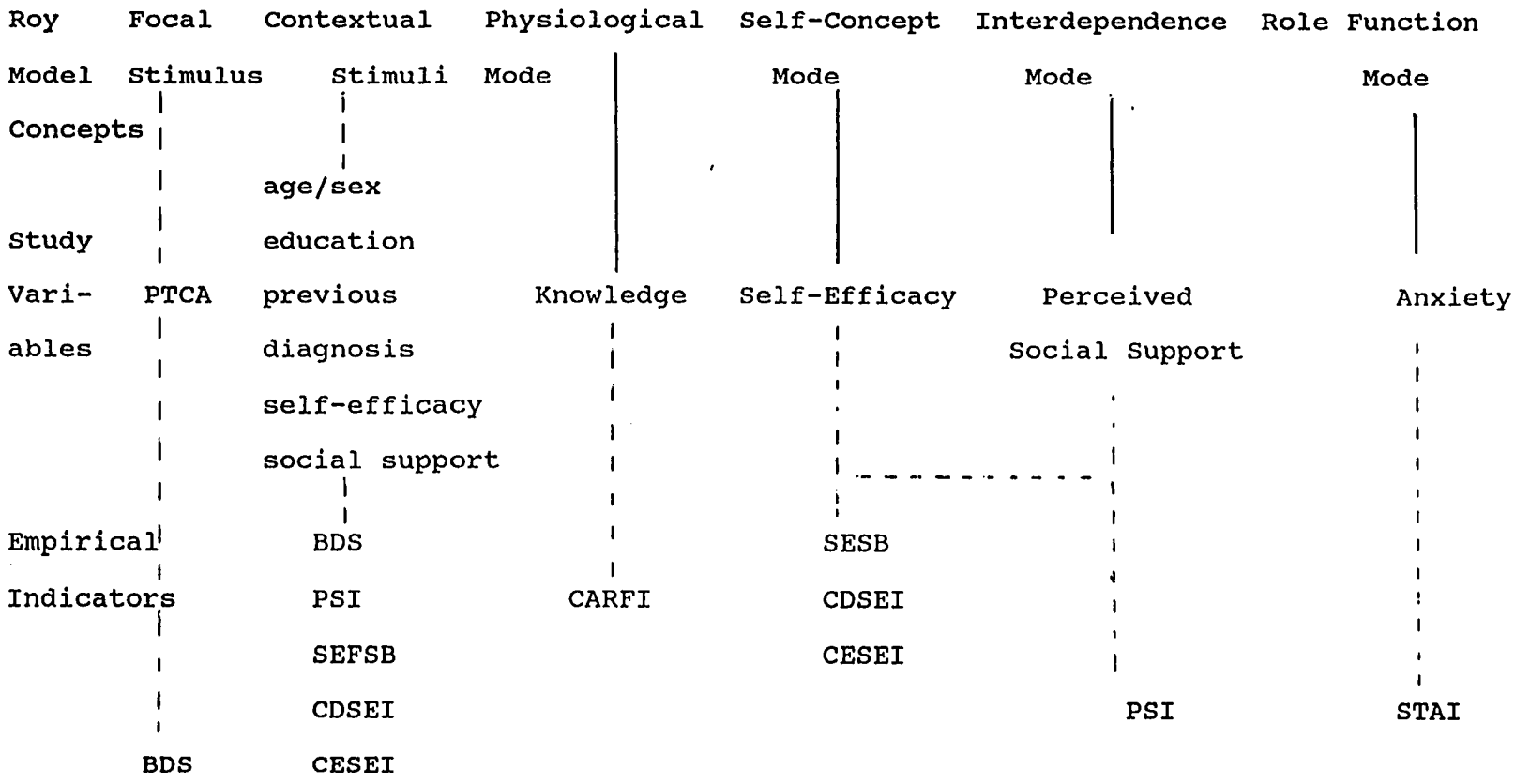

Figure 4. Links among the Roy Adaptation Model, social support, and Bandura's Social Cognitive Theory and empirical indicators. (PTCA = percutaneous transluminal coronary angioplasty, BDS = background data sheet, PSI = Percceived Support Inventory, SEFSB = Self-Efficacy for Smoking Behavior, CDSEI = Cardiac Diet Self-Efficacy Instrument, CESEI = Cardiac Exercise Self-Efficacy Instrument, CARFI = Coronary Artery Risk Factor Inventory, STAI = State-Trait Anxiety Inventory)

assessment was used to identify adaptive and ineffective behaviors within the physiological, self-concept, interdependence, and role function modes. The primary focus of this study was on second level assessment and the identification of contextual stimuli (social support and patient self-efficacy) that influenced the adaptive (coping) or ineffective (not coping) lifestyle behavior changes that the patient relates 6 weeks following the PTCA. Second level assessment is not limited to ineffective behaviors because consideration of primary prevention strategies is a nursing function (Barnfather, Swain, & Erickson, 1989). Second level assessment involves looking for influencing factors on behavior previously described as stimuli (Andrews & Roy, 1986; Piazza & Foote, 1990; Roy, 1984).

Another central concept in Roy's model important to the PTCA patient is that of coping or adaptation. Coping is learned through what Roy and Andrews (1991) describes as an acquired coping mechanism within the cognator subsystem. "Coping mechanisms are the habitual ways the person functions to maintain integrity in everyday life and in times of stress" (Roy & Andrews, 1991, p. 317). In the model used for the study, the person brings his own acquired coping skills to the PTCA experience.

A final concept presented by Roy and applied to PTCA is that of feedback. Feedback provides information that allows the patient to decide whether to increase or decrease efforts to cope with the stimuli.

Coping with stimuli requires the use of both the regulator and cognator subsystems. All four adaptive modes of a person are affected and need to achieve adaptation. In this study, the modes were examined according to their relationship to adaptive lifestyle changes. In the Roy Adaptation Model (Roy & Andrews, 1991) the physiological mode was represented by knowledge, the self-concept mode by self-efficacy, the interdependence mode by perceived social support, and the role function mode by anxiety, since the ability to master a role is often affected by anxiety. Empirical indicators were chosed to measure the variables. The form for conceptual models and theory testing described by Fawcett and Downs (1992) was used to describe this relationship and the empirical indicators. This form provides a framework for assessing behaviors associated with adaptation of the patient following a PTCA (Figure 4).

It was expected that a high level of state anxiety and a low level of knowledge about CAD and risk factors would correlate with a low level of perceived social support and patient self-efficacy resulting in ineffective health behaviors. A low level of anxiety and a high level of knowledge is expected to correlate with a high level of perceived social support, a high level of self-efficacy, and adaptive health behaviors.

Hypothesis

The hypothesis, H_A: Adaptative behaviors of diet modification, exercise, and cigarette smoking can be

predicted or characterized by CAD knowledge, anxiety, social support, and self-efficacy.

CHAPTER II

Review of the Literature

The influence of self-efficacy and social support on adaptation of lifestyle behaviors to CAD after a PTCA was reviewed. To determine the scope of the review, Roy's definition of nursing research was used, which "involves inquiry into basic life processes and how nursing enhances those processes. The research focuses on persons or groups adapting and on those processes that affect health status" (Roy, 1987, p. 44). The categories of research reviewed include the variables in the conceptual framework. The categories are: (a) CAD knowledge, (b) anxiety, (c) social support, (d) self-efficacy, and (e) adaptive health behavior.

A literature search was conducted through a hand and electronic search of Cumulative Index of Nursing and Allied Health Literature from January 1985 to December 1994. Reference lists of selected articles and a hand search of the same time period was conducted on nursing literature based on the nature of the topic of interest in this study. This time period was selected because it reflects current nursing focus on adaptation and care of the patient with CAD.

Parameters were established to determine the reports to be included for review in this study. The established criteria were: (a) the research report must be reported in a referred nursing or medical journal, in a book, or in a dissertation; (b) the subjects of the study must be cardiac patients or a family member of a cardiac patient; and (c) the report must be concerned with CAD knowledge, anxiety, social support, self-efficacy, or adaptive health behavior of the patient.

Social Support

Nursing literature has identified social support as a positive influencing factor in psychological adjustment to stress. During the stressful period of cardiac disease or surgery, social support has been identified as an important aspect in assisting the patient and spouse in their adaptation. Thirty-six research articles on social support were reviewed that fit the parameters established. They were found in 10 referred journals with 51% published in Heart & Lung. The research design of the 36 articles included 42% descriptive, 25% quasiexperimental, 5% qualitative, 22% correlational, and 5% included a combination of the above designs. Fifty-nine percent of the articles were cross-sectional, while 41% utilized a longitudinal time span for evaluating the subjects. The instrument most often used was a standard questionnaire (42%), followed by an interview (22%) and investigator-developed questionnaire (13%). In two studies (6%) a

standard questionnaire was modified, a combination of instruments was used four times (11%), and other methods were used twice (6%). Instruments were primarily quantitative (67%). Four studies (11%) used qualitative research methods and eight studies used a combination of the two (22%). The setting for the assessment was most often at home (36%). Aspects of social support measured were emotional (17%), informational (14%), tangible (2%), social network (11%), and a combination of the above (56%).

Chinn and Kramer (1991) described two ways in which research contributes to theory development, by generating theory and by testing theory. These two categories were used to identify the utilization of theory in this sample of research on social support of cardiac patients. Fifty-nine percent of the research articles were related to theory generating or theory testing. Of these articles 28% had a nursing theory/framework; 72% were theory testing. This finding verifies Silva and Sorrell's (1992) report that little actual nursing theory testing occurs. These findings also suggest that use of nursing theory facilitates theory testing. The authors of the research articles did not consistently relate theory to their findings throughout the report. Authors were more likely to refer to theory in the literature review and state the question, purpose, or hypothesis in terms of the theory. The conclusions were least often related to theory (Table 1). Some form of

research question was stated in all of the sample research articles. Nineteen (53%) identified a statement of purpose, aims, or goals, 11 (30%) identified specific research questions, while 6 (17%) listed research hypotheses.

Table 1

Frequency of Theory Utilized in Components of the Research Articles on Social Support

Components	Frequency	Percentage
Question/purpose/hypothesis		
Stated in terms of theory	13	36.1
Stated, but not in terms of theory	18	50.0
Not Stated	5	13.9
Literature review		
Addresses theory	18	50.0
Does not address theory	18	50.0
Results/discussion		
Addresses theory	13	36.1
Does not address theory	23	63.9
Conclusion		
Addresses theory	8	22.2
Does not address theory	28	77.8

(N = 36).

The variables and concepts studied in the research articles were analyzed for themes or patterns revealing the emergence of six categories: (a) teaching/learning concepts or variables; (b) compliance; (c) family, patient, and spouse coping or adaptation; (d) supportive behaviors and

perceptions of supportive behaviors; (e) wellness, health motivation and health status; and (f) anxiety.

Teaching/Learning Concepts or Variables

The research on social support of the cardiac patient focused on teaching and learning in several ways. First, teaching as a nursing intervention and independent variable was noted. For example, Beckie (1989) examined the effect of a telephone education program on CABG patients, and Peterson (1991) studied the effects of a telephone-based educational program on cardiac catheterization patients. Other examples of teaching programs as independent variables were reviewed (Daumer & Miller, 1992; Miller, Wikoff, McMahon, Garrett, & Ringel, 1988; Thompson, 1989; Thompson & Cordle, 1988). A second way that the concept of teaching/learning emerged was in the study of factors that affect a patient's learning, knowledge, or retention (Miller et al., 1988). A final way that effects of teaching/learning were examined was through measurement of a patient's and/or spouse's satisfaction with learning (Baggs & Karch, 1987; Pommier, 1992).

Two studies identified correlations between informational social support and demographic characteristics. Pommier (1992) found a positive correlation between knowledge of CAD and the number of years of formal education, number of myocardial infarctions (MI), and the number of classes about CAD attended by 100 patients. A negative correlation was found between

knowledge of CAD and age of the patient. Conn, Taylor, and Abele (1991) studied 197 myocardial infarction patients 1 to 2 years after their first myocardial infarction. Lower social support and quality of life scores were associated with increased age, especially in men.

Compliance

Compliance was most often explored as a dependent variable, such as medical regimen compliance or adherence (Conn et al., 1991; McMahon, Miller, Wikoff, Garrett, & Ringel, 1986; Miller, McMahon, Ringel, Siniscalchi, & Welsh, 1989). A typical example of research on compliance was by Miller et al. (1989). This study measured regimen adherence as dependent on a nursing intervention as an experimental condition. They found that one nursing intervention of assessment, problem identification, and goal setting with the patient at 30 days was not sufficient to influence compliance with medical regimen post-myocardial infarction. When Beckie (1989) provided a supportive-educative telephone program for the first 6 weeks after hospital discharge including four to six phone calls, the knowledge of the experimental group was greater, they called health care professionals less often, and had less than one fourth of the readmissions of the control group.

Coping and Adaptation

The research explored coping and adaptation in terms of (a) the patient's ability to cope or adjust (Bohachick et al., 1992; Kolar & Dracup, 1990; Redeker, 1992a, 1992b), (b)

the spouses's ability to cope or adjust (Bramwell, 1986; Riffle, 1988), and (c) family coping and adjustment (Allen, Becker, & Swank, 1991; Gilliss et al., 1990; Hilgenberg, Liddy, Standerfer, & Schraeder, 1992; Riffle, 1988). Coping responses were examined by Nyamathi (1987). In these studies there was positive relationship between subjects' coping abilities and effective adaptations. Redeker (1992a) examined the relationship of different styles of coping to demographic factors finding a negative relationship between age and education and seeking social support and that men sought social support more than women.

Supportive Behaviors and Perceptions of Supportive Behaviors

Studies of supportive behaviors and perceptions of supportive behaviors can be grouped into: (a) studies that examined psychosocial support needs of cardiac patients and their families and (b) supportive behaviors. Riffle (1988) examined perceptions of supportive behaviors of others as the independent variable with wives' abilities to cope as the dependent variable. Riffle interviewed 31 wives, finding that satisfaction with help received from health personnel since the husbands' discharge was related to feelings of ability to handle long-term implications of the husbands' myocardial infarction at the present time and at 6 months hence. Firth and Dracup (1992) examined the relationship between social support and psychological adjustments in 33 patients with serious ventricular

arrhythmias and concluded that patients who perceive themselves as having a high degrees of social support are less likely to be anxious about their health status and social relations and report less psychological distress.

The need for social support may change after treatment for CAD. Stanley and Frantz (1988) found that over half of 26 patients indicated that their levels of dependency on their spouses decreased after CABG surgery, representing an increase in the patients functioning independently.

Wellness, Health Motivation, and Health Status

Studies in this category, including research that scrutinized concepts, such as health locus of control (Fleury, 1991), find no correlation between wellness motivation and social support but a positive relationship between a value for self-discipline in lifestyle and wellness motivation. A positive relationship between health perceptions and quality of life (Daumer & Miller, 1992; Flynn & Frantz, 1987; Packa et al., 1989) has been demonstrated. In addition, a stronger relationship between subject satisfaction with their social network and their reported quality of life (QOL) exists than quality of life and health perceptions. Health status (Allen et al., 1991) and perceived health beliefs (McMahon et al., 1986) were examined, finding that many other factors aside from health status influenced subjects' health beliefs.

Anxiety

Five of the studies utilized anxiety as a variable. These studies had a combined sample size of 402 subjects. (Beckie, 1989; Halm, 1990; Miller et al. 1989; Peterson, 1991; Thompson, 1989). Four studies examined anxiety as a dependent variable with a nursing intervention of teaching and/or support, finding that there was a reduction of anxiety associated with a nursing intervention (Beckie, 1989; Halm, 1990; Peterson, 1991; Thompson, 1989).

Sample Description of Articles on Social Support

The sampling method used in the research articles on social support was nonprobability (75%) using either a convenience or a purposive sample, while the remainder of subjects were randomly assigned to groups (25%). Sample size varied (Table 2). Subjects were primarily caucasian males, 18 years of age or older, with a myocardial infarction (Appendix A). Note that in the overwhelming majority of studies that included both males and females as subjects (75%), males outnumbered females, comprising an average of 66% of those study samples.

Findings of Reviewed Research

The findings can be categorized into the following themes: (a) planned teaching to cardiac patients, (b) planned teaching to spouses and families, (c) ineffective or inadequate teaching, (d) emotional support provided by the family and nurses, and (e) nursing actions.

Table 2

Sample Size of Research on Social Support

Group range	Number	Percent
Less than 20	2	5.6
21-50	13	36.1
51-100	13	36.1
101-200	7	19.4
More than 200	1	2.8

(N = 36).

The conclusions stated in the research articles were summarized in six overall themes. These themes are: (a) importance of social support (Allen et al., 1991; Conn et al, 1991; Cronin & Harrison, 1988; Garding, Kerr, & Bay, 1988; Hawthorne, 1994; Kolar & Dracup, 1990; Packa et al., 1989), (b) more social support/information is needed (Baggs & Karch, 1987; Davenport, 1991; Miller et al., 1989; Peterson, 1991; Pommier, 1992), (c) importance of planned actions for social support (Beckie, 1989; Garding et al., 1988; Packa et al., 1989), (d) the importance of a critical time for social support (Bramwell, 1986; Garding et al., 1988; Redeker, 1992b; Tack & Gilliss, 1990), (e) spouses and family are important members of cardiac patients' social networks (Gilliss et al., 1990; Kolar & Dracup, 1990; McMahon et al., 1986; Miller et al., 1988), and (f) importance of nurses supporting spouses and family members (Boykoff, 1986; Fleury, 1991; Hilgenburg et al., 1992;

Norheim, 1989; Norris & Grove, 1986; Thompson & Cordle, 1988).

Summary of Status of Research on Social Support

In summary, this review indicated that there has been an adequate amount of research in the area of social support of cardiac patients. However, no literature was located that used PTCA patients as the sample population for studying social support.

In examining the relationship of theory to research in this area, several important facts emerge. First, 50% of the studies could not be categorized into either theory generating or theory testing. This finding suggests that 50% of the research may not have a theoretical basis. Second, theory is not linked consistently to any component of the research process, that is, the question, purpose or hypothesis, literature review, results, discussion, or conclusion. These two findings are consistent with those of Silva (1986), who found inadequate utilization of theory in nursing research articles.

A strength of research in this area is the wide diversity of variables and the emergence of patterns of variables and concepts studied. This emergence of patterns in specific research suggests a beginning basis for a theoretical framework.

Self-Efficacy

The influence of self-efficacy and support on adaptation of lifestyle behaviors to CAD after a PTCA was

reviewed. The categories of research reviewed include the variables in the conceptual framework. The categories are: (a) knowledge, anxiety, and self-efficacy; (b) self-efficacy and spousal social support; and (c) adaptation of lifestyle behaviors for smoking, diet, and exercise.

A literature search was conducted through a hand and electronic search of Cumulative Index of Nursing and Allied Health Literature from January 1985 to December 1994. Reference lists of selected articles were obtained and a hand search of the same time period was conducted on literature based on the nature of the topic of interest of this study. This time period was selected since it reflects current nursing focus on adaptation and care of the patient with CAD.

Parameters were established to determine the reports to be used for review in this study. The established criteria was: (a) the research report must be published in a referred nursing or medical journal, book, or dissertation; (b) the subjects of the study must be adult patients; and (c) the report must relate self-efficacy to adaptation or social support. Limited reports were found with these parameters, thus, making it difficult to analyze the literature. The following research reports fell within the identified parameters.

Knowledge, Anxiety, and Self-Efficacy

The importance of self-efficacy as a cognitive factor explained why some individuals are unable or unwilling to

perform behaviors that are clearly within their repertoire. Bandura (1989) pointed out there is a marked difference between possessing skills and being able to use them well in diverse circumstances. For this reason, different people with similiar skills, or the same person on different occasions, may perform poorly, adequately, or exceptionally.

When individuals are in a state of anxiety they are more likely to have low self-efficacy. Dennis (1987) measured the self-efficacy of patients in relation to the control patients had over potentially stressful situations and found that having information about diagnosis, treatment, and lifestyle implications of their disease process was critical to patients' development of cognitive control. A study examining smokers' self-efficacy and anxiety levels found a high self-efficacy was related to a low level of anxiety among their subjects (Stretcher, Becker, Kirscht, Eraker, & Graham-Tomasi, 1985). However, Murphy et al. (1989) found that the level of anxiety was not a significant factor in predicting knowledge gain in patients who had a PTCA.

In a study involving 67 cardiac surgery patients, Gortner, Miller, and Jenkins (1988) found that efficacy expectations 4 to 12 weeks after surgery increased significantly for lifting and general exertion and for interaction at work. The experimental group was involved in an inpatient slide and teaching programs on cardiac rehabilitation and risk reduction as well as intensive

telephone follow up and coaching on recovery through the 8 postoperative weeks. Experimental subjects significantly increased their perceived expectations for lifting at 12 weeks (t = 2.19, p = .034), but perceived less efficacy than the control group in tolerance of emotional distress (cited in Gortner, Miller, & Jenkins, 1988).

Self-Efficacy and Social Support

Stretcher et al. (1985) examined psychosocial aspects in smokers and found a relationship between anxiety and self-efficacy. This relationship was strongly buffered by the level of encouragement in quitting smoking from other household members (Chi-square = 7.19, $p < .01$). They also found that over three times as many subjects with a high level of perceived social support wished to quit smoking than those with a low level of social support.

Little research was found that related self-efficacy and social support. Taylor, Bandura, Ewart, Miller, and Debush (1985) tested ways to use an exercise test to strengthen spousal perceptions of patients' physical and cardiac capabilities after a myocardial infarction (MI). Ten wives were randomly assigned to sit in the lobby during treadmill testing, 10 to observe the treadmill test, and 10 to observe and participate in the test. Efficacy expectations were measured in both patient and spouse before the exercise test, after the test, and after counseling by a cardiologist and a nurse. Patients showed significant increases in their perceptions of their cardiac capabilities

after treadmill testing and counseling ($F = 7.5$, $p < .001$). Spouses' ratings of their husbands' cardiac and physical capabilities were substantially lower than those of their husbands', indicating doubts about the capability for physical effort. After wives who did not walk on the treadmill were counseled, no increases in perception were noted. However, in those wives who walked there was a significant increase in their perception of their husbands' cardiac and physical capabilities ($p < .05$).

Self-Efficacy and Adaptation

Stretcher, DeVellis, Becker, and Rosenstock (1986) reviewed studies on cigarette smoking, weight control, contraception, alcohol abuse, and exercise behaviors. Their review supported a strong relationship between self-efficacy and health behavior change and maintenance. Self-efficacy has been identified as a predictive variable for adaptive health behaviors in cardiac patients (Gortner & Jenkins, 1993; Hickey, Martin, & Secenj, 1993). Studies linking self-efficacy and adherence to a low-fat diet were not found. Carrol's (1993) study found self-efficacy explained 37% of the variance in exercise behaviors. Robertson and Keller (1992) studied the relationship of health beliefs, self-efficacy, and exercise adherence in patients with CAD. They found that patients with a higher perception of self-efficacy had more adherence to their exercise regimen.

Kelly, Zyzanski, and Alemagno (1991) examined the role of self-efficacy, in addition to social support and health

beliefs, on prediction of motivation and behavior change following a health promotion intervention. These relationships were examined for behavioral change with cigarette smoking, dealing with stress, amount and type of food eaten, use of seat belts, and exercise habits. Self-efficacy was a significant prediction of lifestyle change. With the execption of smoking, their findings suggested that increased support from family and others was associated with a feeling that behavior change would be easier and more likely to be successfully accomplished.

Anxiety

Anxiety may interfere with functioning and thus influence individuals' modifications of CAD risk factor behaviors. It has been documented that anxiety was a major variable affecting behavior (Rotter, Chance, & Phares, 1972; Townsend, 1993). In the Roy Adaptation Model, anxiety was conceptualized as a problem requiring adaptation by the person. Positive adaptation required the patient to change in response to the environment (Roy, 1984).

Depression has been identified as an important psychiatric disorder of the elderly with chronic illness (Katon & Sullivan, 1990). Depression was associated with low expectations for improvement and usually considered an outcome rather than a predictor of behavior (Townsend, 1993). Badger (1993) found that self-efficacy was a significant predictor of depression in older adults with a

physical impairment. When subjects had a high self-efficacy, they had a low level of depression.

The Roy Adaptation Model provided the framework for the use of anxiety, rather than depression, as a predictor variable for this study. In addition, the subjects in this study were acutely ill when they were hospitalized with their first PTCA and the majority were diagnosed with heart disease on admission. In contrast to anxiety, depression is often related to a chronic condition (Rotter et al., 1972). The concept of depression has been associated with hopelessness, perceived loss of control, and passivity, thus depression was considered a subvariable tested by self-efficacy and may not contribute new information about adaptation of health behavior (Campbell, 1987).

Adaptation

Three common adaptive behaviors are recommended for cardiac patients to reduce the risk of future cardiac problems. These are cessation of smoking, dietary modifications, and an exercise program. The benefits of quitting smoking have been well publized. More than 38 million Americans have quit smoking, however, 50 million Americans continue to smoke (29% of all adults) (Novella, 1990). In one study on 80 smokers who had cardiovascular surgery, 40% of the subjects abstained from smoking during hospitalization compared to only 10.7% of general surgery patients (Wervers, Boven, Stanislaw, & Desemone, 1994). Smoking cessation has been positively influenced by social

support, but this did not influence maintenance at 6 months (Mermelstein, Cohen, Lichtenstein, & Kamarch, 1986). Partner social support and perceived availability of general support have been associated with cessation of smoking and 2 to 3 months maintenance of abstinence for subjects (Coppotelli & Orleans, 1985; Mermelstein et al., 1986). However, the presence of smokers in the subjects' social networks was a hinderence to maintenance of smoking cessation (Mermelstein et al., 1985).

Numerous studies support the association between a sedentary lifestyle and the risk of coronary artery disease. The promotion of physical activity to help in secondary prevention (after CAD has become clinically apparent) of CAD has been well accepted (Livergood, Capersen, Koplan, & Blair, 1993).

Dietary treatment of patients with established CAD resulted in significant reduction of progression and even regression of coronary arterial lesions (Ornish, Brown, Scherwitz, & Billings, 1990; Watts et al., 1992).

Little data were found on adaptive lifestyle changes of patients following PTCA. Bliley and Ferrans (1993) found a significant increase in exercise and smoking cessation in 40 patients 4 to 6 weeks after a PTCA. Mooney et al. (1992) studied patients 2 years after PTCA and CABG surgery, finding that CABG patients were more likely than PTCA patients to perceive a need to make favorable changes in their behavior at home, at work, during recreation, and in

social activities compared to before their procedure. Other studies also compared these two groups' work performances, finding that overall functioning upon return from home was more improved with CABG patients than with PTCA patients. Gaw (1992) conducted a pilot study examining motivation and lifestyle changes in patients who had a PTCA. Only 4 out of 14 patients interviewed in the hospital planned any lifestyle modification behaviors upon returning home. Two of the patients were not aware they had heart problems. After hospitalization none of the patients who stated they would perform risk factor reduction behavior after PTCA followed through with their intentions. Three family members expressed concern about false hopes and unrealistic expectations of the patients. Two spouses felt that more time should have been taken by the cardiologist when speaking with the family about the results of the procedure. Gaw (1992) indicated a need for family support to help with modification of lifestyle and maintenance of new behaviors. Hanson (1988), in a comparison of compared adaptation in PTCA patients and CABG patients, proposed that PTCA patients may not view the situation as serious and may be less motivated than CABG patients to reduce their risk factors. However, Raft, McKee, Popio, and Haggerty (1985) found that PTCA patients were better adjusted and functioned better at work, in sexual performance, and with their families than CABG patients. Significantly greater improvements in mood state and physical functioning have been demonstrated in

PTCA patients when compared to CABG patients (Papadantonaki, Stotts, & Paul, 1994).

The literature reviewed on self-efficacy and social support substantially supported a relationship to adaptation. Adaptation following PTCA has not been studied in research to the extent CABG surgery or myocardial infarction patients have. Regardless, without lifestyle changes after a PTCA, a patient continues to subject himself to risk factors that increase the likelihood of future CAD problems.

Summary

In the literature review it was clear that, although a variety of methods have been used by investigators, the findings supported the influence of variables affecting subjects' adaptations to heart disease. CAD knowledge, anxiety, social support, and self-efficacy have an impact on the adaptive health behaviors of patients treated with a PTCA. It is not clear what relationship these variables have to each other or the strength of their influences on adaptation of health behaviors. In addition, this impact is modified and complicated by other factors that influence patient response.

A growing body of literature suggests the power of social support in influencing adaptation to CAD, but it is not clear what other factors may more profoundly influence adjustment or interfere with this adjustment to CAD. Few

studies have examined the variables of CAD knowledge, anxiety, social support, and self-efficacy in PTCA patients.

CHAPTER III

Methodology

The purpose of this study was to determine the influences anxiety, CAD knowledge, social support, and self-efficacy have on adaptive health behaviors of patients treated with a PTCA. Presented in this chapter is a description of the methods used to collect and analyze the data for this study. Following a description of the design chosen, the instruments, sample, and procedures are described. Techniques of data analysis are also described.

Design of the Study

The design was a cross-sectional descriptive study using a convenience sample. This design was used because the purpose of the study was to describe the relationship of the variables to adaptation at a fixed point in time (Polit & Hungler, 1991).

Instrumentation

All data for this study were collected by the investigator. Participants were contacted during their hospitalization and then later by phone, 6 to 8 weeks post-PTCA. A demographic data form was completed on each potential subject (Appendix B). Subjects were asked to complete the questionnaires themselves or verbally respond

while the investigator recorded their responses on the questionnaires. The instruments used were: (a) the Coronary Angioplasty Risk Factor Inventory (CARFI) (Appendix C); (b) the State-Trait Anxiety Inventory, Form Y (Appendix D); (c) the Cardiac Diet Self-Efficacy Instrument (CDSEI) (Appendix E); (d) the Cardiac Exercise Self-Efficacy Instrument (CESEI) (Appendix F); (e) the Self-Efficacy for Smoking Behavior (Appendix G); (f) the Perceived Support Inventory (Version A) (Appendix H); and (g) risk factor measurement tools: the Food Frequency Checklist (Appendix I), an exercise frequency checklist (Appendix J), and an interview form (Appendix K).

Knowledge

Knowledge of CAD disease was reflected by the score on the Coronary Angioplasty Risk Factor Inventory (CARFI), Form 3, which is a self-administered questionnaire on CAD risk factors. This instrument was developed by Murphy and Fishman (Murphy et al., 1989). A panel of experts, including cardiovascular clinical nurse specialists, exercise physiologists, and clinical dietitians, helped develop the questionnaire. Criterion-related validity was documented by correlations between CARFI scores and IQ (r = .30, $p < .01$) and educational level (r = .37, $p < .01$) (Murphy et al., 1989; Polit & Hungler, 1991). Concurrent validity of the CARFI was demonstrated by comparing knowledge scores and CAD risk factor knowledge taken from structured interviews conducted on 57 patients. CARFI and

interview knowledge were positively correlated (r = .32, p < .01). Test-retest reliability on pre-PTCA and 6 months post-PTCA patients was .76 in pilot testing by Murphy et al. (1989). Cronbach's alpha was used to assess internal consistency of items in the CARFI. It was .71 for risk factor items.

Anxiety

Anxiety was measured with the State-Trait Anxiety Inventory (STAI) (Form Y) (Spielberger, 1983). Both the trait and state anxiety scales were used to determine the general state of anxiety and the anxiety at the time of the subjects' hospitalization for the PTCA and 6 to 8 weeks post-PTCA.

More than 5,000 subjects were tested for the construction and stabilization of Form Y. Reliability was computed using test-retest correlations for the STAI Trait (T) Anxiety scales. Correlations for college and high school students were .765 and .695, respectively (Spielberger, 1983). For the State (S) Anxiety scale, reliabilities ranged from .16 to .62 with a medium reliability of .33 (Spielberger, 1983). Stability coefficients with test-retest correlations for the STAI State scale were low, as Spielberger (1983) expected for a measure designed to be influenced by situational factors. Measures of internal consistency with the median alpha coefficients were .90 for T-Anxiety and .93 for S-Anxiety with samples of working adults, students, and military

recruits (Spielberger, 1983). Alpha coefficients were higher for the STAI S-Anxiety scale when given under conditions of psychological stress, ranging from .89 to .94 (Spielbergeer, 1983). Construct validity was demonstrated by scores of neuropsychiatric patients, working adults, military recruits, and college students being significantly higher under stressful conditions (Spielberger, 1983). Correlations of T-Anxiety Scale with the Institute for Personality and Ability Testing Anxiety Scale (IPAT), the Manifest Anxiety Scale (TMAS), and the Affect Adjective Checklist (AACL) were .76, .79, and .58, respectively with college males (Spielberger, 1983). Correlations with the IPAT Anxiety Scale and Taylor Manifest Anxiety Scale (TMAS) of .75 and .80 respectively. The STAI Anxiety State correlation with the Cornell Index of .70 indicated that a large number of medical symptoms are associated with a high score. Numerous tests for validity have been done supporting this as a useful tool in assessing anxiety (Spielberger, 1983). The STAI has been widely used by psychologists, physicians, and nurses, as well as numerous other disciplines. It has been demonstrated that usually STAI S-Anxiety scores rise immediately prior to surgery and decline as patients recuperate (Spielberger, 1983).

Self-Efficacy

Self-efficacy was measured with the Cardiac Diet Self-Efficacy Instrument (CDSEI) and the Cardiac Exercise Self-Efficacy Instrument (CESEI) to determine the subjects'

confidences about performing healthy diet and exercise behaviors. The instruments have previously been tested with cardiac patients. Hickey et al. (1992) report reliability for the CDSEI and CESEI as for internal consistency estimates as .89 and .92, respectively. Stability estimates (3 days apart) are $\underline{r}$ = .86 and .87. Validity was analyzed by: (a) content validity--via a panel of expert judges; (b) construct validity--principle factor analysis supported the a priori homogeneous, unidimemsional factor structures of the CDSEI and CESEI; (c) known groups validity--the instruments distinguished between a group expected to have high percepts of diet and exercise self-efficacy (marathon runners) and a group expected to have lower percepts (CRPs); and (d) predictive validity--significant relationships were found between percepts of self-efficacy and subsequent diet behavior ($\underline{r}$ = .62, $\underline{p}$ = .0001) and subsequent exercise behavior ($\underline{r}$ = .53, $\underline{p}$ = .0001) in the cardiac population (Hickey et al., 1992; Polit & Hungler, 1991).

Smoking self-efficacy was measured by using the Self-Efficacy for Smoking Behavior (SESB) (DiClemente, 1981) to determine the subjects' confidences for avoiding smoking. DiClemente reports reliability correlations of individual scale items with the total scale ranging from .58 to .76, with an average of .68. In a study of 63 subjects, self-efficacy scores showed no significant correlations with demographic variables and two significant but low correlations with smoking history: age began smoking

(r = -.25) and cigarettes smoked per day prior to quitting (r = .28). There were significant correlations between self-efficacy scores and the follow-up variables of successful abstinence (r = .42) and reported difficulty in maintaining abstinence (r = -.45).

Social Support

Social support was reflected by the amount of emotional, informational, and tangible support perceived by the subjects. Participants completed the Perceived Support Inventory (Yates, 1989) listing up to four persons who had influenced (helped and/or hindered) them during the 6-week period following their PTCA. Subjects then answered a set of 16 questions for each person listed. Informational support was operationalized as suggestions about what to do, how to solve problems, or where to get needed information during the post-PTCA 6-to 8-week period. Tangible support was defined as tangible assistance or help with errands or tasks around the house, going for walks, preparing special foods, or providing transportation. Likewise, emotional support was defined as someone listening to private thoughts and feelings, and/or giving physical affection. These three dimensions of support were measured by two separate methods. Method 1 asked subjects to assess: "How much has advice and information from your partner helped and/or hindered you during this time of recovery?" Subjects were instructed to assign a +1 to +10 to those persons who helped (+10 being the most help given), a -1 to -10 to those persons who

hindered, and a "0" to those who neither helped nor hindered. Scores for each item could range from 0-10 to indicate either a "helping" and/or a "hindering" effect.

The second method of measuring social support was a 7-point Likert scale measuring the amount of emotional, informational, and tangible assistance received during the time of recovery (from a particular person). Each item could range from no help at all to a great deal of help.

Adaptive or Ineffective Behavior

Adaptive or ineffective health behavior was determined through recall measures. Smoking habits, dietary intake, and exercise patterns were compared with these behaviors 6-weeks post-PTCA. The UAB School of Medicine Food Frequency Checklist was used to determine if there was a change in the fat content of the subjects' diets. This questionnaire asked subjects to recall the freqency of food items consumed in the past week. Three clinical dieticians rated the food items on a Likert scale of 1-5. A composite score was obtained for use in scoring by taking the mean of their scores for each item (Appendix N). In addition the subjects were asked if they had made any changes in their diet over the past month and if so what changes. A subsample of 10 subjects was interviewed regarding the honesty of their statements on the Food Frequency Checklist after completing the form to check for validity of the data (Appendix L). Reliability of dietary data was checked by comparing the subjects' responses with their responses on

the Food Frequency Checklist. Validity of the form was evaluated by asking the subjects if they felt the categories of food on the Food Frequency Checklist included foods they usually ate (Appendix L). Construct validity was demonstrated by factor analysis correlating diet scores with self-efficacy for diet in the hospital (r = .84) and 6- to 8-weeks post-discharge (r = .74). Smoking behavior was assessed by asking the subjects to report the average number of cigarettes smoked a day over the past week. A score of .1 was assigned for each cigarette smoked. Physical activity was assessed by asking the subjects to identify frequency and type of exercise they engaged in over the past month (Appendix J). Content validity was obtained by having three cardiac rehabilitation nurses review the exercise form prior to administration. The inherent value of these exercises was validated by the ratings of the cardiac nurses. The methodological convergent validity was assessed by asking subjects if they increased or decreased their exercise over the past month, and if there had been a change, why. In addition, if it remains the same the subjects were asked why it does. They were asked what motivated them to make changes if they have reported changes in these health habits. What affect spiritual, emotional, cognitive, and physical factors played in their adaptive health behavior change was also asked. Demographic data were collected on complications occurring in the subjects since the PTCA. Subjects were asked if they had any

additional problems requiring readmission to the hospital or additional visits to the physician because of problems since discharge from the hospital.

Subjects

The subject pool for this study was patients with the principle diagnosis of CAD who were admitted to a private 201-bed teaching acute care hospital in a rural area of Northwest Georgia. Potential subjects were excluded if: (a) the patient had a previous PTCA or CABG, (b) the patient was unable to participate in postprocedure exercise due to physical limitations, (c) the patient did not speak English, (d) the patient would not be available by telephone after discharge, (e) the patient had a history of or was currently psychotic, and/or (f) the patient was discharged to a nursing home or extended care facility.

Procedure

Institutional Review Board approval to solicit subjects was gained from the participating hospital and from the University of Alabama at Birmingham. The hospital and attending physicians reviewed the study protocol for human subjects' considerations and approved the study. Names of potential subjects and attending physicians were identified by the investigator from verbal reports of hospital nurses when a patient was scheduled for a PTCA. A convenience sample of 94 potential subjects was selected. This sample size of subjects was chosen based on the number of variables

examined in this study that were hypothesized to influence adaptation and allow for a 20% attrition (Polit & Hungler, 1991).

Following institutional permission to review records and physician permission to contact patients, the investigator reviewed the records of a convenience sample of patients admitted with a diagnosis of CAD and scheduled for a PTCA to determine eligibility.

Potential subjects' addresses, phone numbers, background data (age, race, marital status, education, occupation, previous admissions to the hospital and/or coronary care unit, and risk factors for CAD), and dates of PTCA were retrieved from the hospital records. Patients meeting the eligibility criteria were contacted in person during the hospital admission by the investigator. A written explanation of the study and the study criteria were given to each potential subject. Informed consent was obtained from each subject (Appendix M).

Subjects who agreed to participate were interviewed by the investigator and asked to complete questionnaires or verbally respond while the investigator recorded their responses on the questionnaires in the hospital. Six to 8 weeks following hospital discharge, at a time that subjects identified as convenient, a telephone follow up for collection of further data was made. The instruments and data forms were completed by the investigator over the telephone, and the information was verified with the

subjects. The data collection was scheduled 6 to 8 weeks following discharge. Literature suggests that adaptive behavior that would be long term would be more accurately assessed at this time than immediately following hospitalization (Tack & Gilliss, 1990).

All subjects were informed of the purpose, benefits, risks, and procedures of the study by the investigator in person. All subjects were told that their participation was entirely voluntary and they had the right to withdraw at any time. A consent form (see Appendix M) was signed by the patient and witnessed by the investigator. This form was then kept by the investigator in a locked file.

Anonymity of subjects was not possible with this study design, but confidentiality was guaranteed. Each battery of instruments was identified by numerical coding. Numbers were assigned to identify subject questionnaires, and a cross reference list of numbers and names was kept in a locked file accessible only to the investigator and destroyed following completion of the study. All findings were reported as group data so that no identification of subjects could be done.

Analysis of Adaptive Behavior

The hypothesis states that adaptive behaviors of diet modification, exercise, and cigarette smoking can be predicted or characterized by CAD knowledge, anxiety, social support, and self-efficacy.

To examine the relationship between CAD knowledge, anxiety, social support, and self-efficacy with adaptive health behaviors of diet modification, exercise, and cigarette smoking, stepwise multiple regression was used for each adaptive behavior. Since two groups of continuous variables were compared canonical correlation was also used to measure the relationship between the set of predictive variables consisting of CAD knowledge, anxiety, social support, and self-efficacy and the set of dependent variables of diet modification, exercise, and smoking. Descriptive statistics were used to examine the interview data on why adaptive health behaviors of diet modification, exercise, and cigarette smoking did or did not occur. The amount that physical well-being, emotional well-being, CAD knowledge, and spiritual factors influenced subjects to change their behavior was also described. The CAD knowledge was determined by the total score on the CARFI. State anxiety was determined by the score on the STAI Form Y-1 and trait anxiety was determined by the score on the STAI Form Y-2. Social support was measured by totaling the score on the items directly relating to perceived support on the Perceived Support Inventory (Version A). Self-efficacy for diet, exercise, and smoking was measured by the separate scores on the CDSEI, CESEI, and SESB, respectively. Correlational analysis was used to assess the association between individual adaptive behaviors of diet modification,

exercise, and cigarette smoking and the study variables of CAD knowledge, anxiety, social support, and self-efficacy.

CHAPTER IV

Analysis and Discussion

Analysis will be presented in two stages. In the first, the descriptive stage, the details of means, standard deviations, and correlations will be provided and summarized by exploratory factor analysis without regard to hypothesis testing. Factor analysis and canonical correlation were used as statistical supportive measurements but had limitations in this study due to the small sample size. Due to the instability of factor loadings with this small sample, the findings must not be considered with credulity. The descriptive stage of analysis will follow an inductive pattern of inferences from particular to general. In the second stage, inductive and deductive patterns of inquiry will provide the basis for the testing of the hypothesis. Specifically, stepwise regression followed by canonical correlation will provide a global or omnibus perspective.

Transformations/Missing Data

A mean score was substituted for the missing data for 1 subject on the CAD knowledge score 6- to 8-weeks postdischarge because this was the only missing value for this predictor variable. All other data were collected on this subject. All other missing data were represented by a

missing-value code and processed by pairwise deletions in Statistical Package for the Social Sciences. Statistical calculations were performed on 71 subjects for the exercise adaptive variable because 11 subjects were not able to participate in exercise as expected at the onset of the study. Statistical calculations were performed on 24 subjects for the smoking variable because these were the subjects that smoked. All other calculations were based on 82 subjects.

Descriptive Data

Description of the Sample

A convenience sample of subjects was employed. Subjects were selected by the following criterion: (a) having their first PTCA, (b) English speaking, (c) able to participate in exercise, and (d) not currently or previously psychotic. They were all discharged to private homes and were available by telephone for follow up. The subjects were invited to participate in the study by the investigator. Questionnaires were completed by the subjects or the investigator in the hospital and then again 6 to 8 weeks postdischarge over the phone. Follow-up data collection was made at a time identified as convenient by the subjects.

A total of 82 subjects participated in the study. Ninety-four subjects were contacted, 12 declined to participate or withdrew part way through data collection. Information on CAD knowledge was not obtained on 1 subject.

The data for the exercise variable were disqualified for 11 subjects who underwent subsequent medical/surgical procedures. These subjects were unable to exercise due to intervening circumstances unforeseen at the beginning of the study that limited their activities. These circumstances were either complications from heart disease or unrelated to their heart diseases (i.e., knee or cataract surgery).

The average age of the participants was 61.3 years (SD = 12.1), but ages ranged from 30 to 83 years. Most subjects were married (Table 3), male (61%, n = 50), and Caucasian (92.7%, n = 76). The only other race represented was Black (7.3%, n = 6). The majority of subjects did not attend college (Table 4). Most subjects had been previously admitted to a hospital (91.5%, n = 75), but had not been previously diagnosed with a heart condition prior to this admission (69.5%, n = 57) or previously admitted to the coronary care unit (84.1%, n = 69). Most subjects had not previously adhered to a special diet (74.4%, n = 61). A minority of the subjects smoked cigarettes when they were admitted to the hospital (28%, n = 23).

Variable Measurement

Total scores were obtained on The Coronary Angioplasty-Risk Factor Inventory, Form 3 (Appendix C); the STAI, Form Y-1 (Appendix D); the STAI, Form Y-2 (Appendix D) ; and the Self-Efficacy for Smoking Behavior (Appendix G). A mean score was obtained on the Cardiac Diet Self-Efficacy

Instrument (Appendix E) and the Cardiac Exercise Self-Efficacy Instrument (Appendix F).

Table 3

Marital Status

Marital status	Frequency	Percentage
Married	62	75.6
Single	1	1.2
Divorced	8	9.8
Widowed	11	13.4

(N = 82).

Table 4

Educational Level

Educational level	Frequency	Percentage
Less than high school	36	43.9
High school graduate	23	28.0
Attended college but did not graduate	15	18.3
College graduate	8	9.8

(N = 82).

A composite score was obtained for the subjects' diets based on the mean score of food items rated by three clinical dieticians (Appendix N). Scores representing types of support and satisfaction with support were calculated from the Perceived Support Inventory (Version A) (Appendix H). Descriptive statistics of the test scores in the hospital and 6 to 8 weeks after discharge were obtained (Appendix O).

Perceived Support

One of the influencing variables examined was social support. These data were obtained from the Perceived Support Inventory (Version A) (PSI) (Yates, 1989) (Appendix H). A total score for the instrument was not obtained due to the varied types of data related to social support obtained with this tool. A social support score (reflected in Appendix O as Support) was obtained by totaling the subjects' ratings of types of support for the six questions rating informational, tangible, and emotional support. These three types of support were grouped based on Yates's (1989) finding of no difference among the factors. In her factor analysis all three dimensions loaded between .46 and .83 on the same dimension (Yates, 1989).

In this study, these six questions were changed from a Visual Analogue Scale (VAS) to a 7-point Likert scale so information could be obtained over the phone. A Cronbach's alpha for the items was .93. Reliability scores on the VAS items were not calculated because they were treated as individual items (Yates, 1989). Yates modified the Perceived Support Network Inventory (PSNI) (Oritt, Paul, & Behrman, 1985) for her study to a VAS. The PSNI, the original instrument, used a 7-point Likert scale for these items. Oritt, Paul, & Behrman reported an alpha of .77 on the PSNI, demonstrating the internal consistency of the instrument.

In the present study, PSI scores were available before and after the PTCA. Since the ranges of the items on the PSI are different for different items, no total scores for the PSI were derived. A factor analysis of the items on the PSI was conducted for descriptive purposes. PSI scores are reflected in Table 5. Yates (1989) provided a factor analysis of the PSI in her dissertation. Based on the results of Yates' factor analysis, the types of support listed in items 1-3 and 14a-14c were totaled as a measure of support. Items 11 and 12 were totaled as a measure of satisfaction with support. Items 5 and 6, including data on the percentage of free time spent with the partner and the percentage of time spent arguing, were significant at the .05 level. In the present study, communication frequency (items 8a and 8b), including the number of times and the number of minutes spent talking in a typical day, was difficult for many subjects to answer, resulting in missing data ranging from 39% to 73% on these items.

Appendix P provides correlations between the difference scores described in Table 5. These correlations were done to determine associations between the various items related to social support that were included on the PSI.

Moderate positive correlations were found among support, closeness, sought support, provided support, and satisfaction with support. A moderate positive correlation was also found between disagreements and disagreements

related to illness. No other notable associations were noted among the items.

Table 5

Items Scores on PSI

Item #	Pre-M	Post-M	Difference	t	p value
Support					
1-3, 14a-14c	43.43	41.79	1.65	1.45	.152
Closeness					
4	93.68	93.34	1.34	.91	.363
Free time					
5	73.83	66.99	6.84	2.43	.017
Disagreements					
6	7.28	2.93	4.35	2.28	.025
Disagreements unrelated to illness					
7a	12.07	8.35	3.72	.94	.351
Disagreements related to illness					
7b	28.17	24.57	3.60	.68	.497
Time communicating					
8a	17.81	12.58	5.23	1.53	.142
8b	117.91	112.48	5.43	.39	.698
Sought support					
9	6.16	6.20	-.04	-.23	.816
Provided support					
10	6.68	6.55	.13	.95	.343
Satisfaction with support					
11-12	13.39	13.13	.26	.98	.330
Receives support					
13	6.76	6.80	-.49		

(N = 82).

Factor analysis employing the Kaiser criterion and varimax rotation disclosed the loadings in Table 6. The four components had eigenvalues greater than 1: (a) 4.26

Table 6

PSI Change Loadings

Variable	Factor 1	Factor 2	Factor 3	Factor 4
SUPDIF	.80	-.14	-.07	.10
CLDIF	.76	-.09	.09	.17
FRTDIF	.41	.02	-.11	.49
AGPDIF	-.27	.85	.05	-.06
AGIDIF	.02	-.13	.74	.27
AGODIF	-.14	.72	-.50	-.09
NTIMDIF	-.12	-.06	-.70	.37
NMIMDIF	-.09	-.07	.07	.79
SGTDIF	.80	-.16	.03	.01
PRVDIF	.90	-.09	.10	-.14
SATDIF	.88	-.06	.14	-.04
RECDIF	.53	.44	.17	.33

SUPDIF = support difference

CLDDIF = closeness difference

FRTDIF = free time difference

AGPDIF = argue percent difference

AGIDIF = arguments related to illness difference

AGODIF = arguments related to other matters difference

NTIMDIF = number of times difference

NMINDIF = number of minutes difference

SGTDIF = sought support difference

PRVDIF = provide support difference

SATDIF = satisfied difference

RECDIF = received support difference

(N = 82), PSI = Perceived Support Inventory.

(35.5%), (b) 1.59 (13.3%), (c) 1.22 (10.2%), and (d) 1.11

(9.3%), total 68.3%. There appear to be four factors: (a) Factor 1: perceived support, (b) Factor 2: disagreements unrelated to illness, (c) Factor 3: disagreements related to illness, and (d) Factor 4: time communicating.

Differences in scores with time

The differences between the predictor variable scores obtained in the hospital and 6-to 8-weeks postdischarge are reflected in Table 7. There was a significant change in all the predictive variable scores between the two times of measurement except for social support and smoking self-efficacy. There was a significant increase in CAD knowledge, diet self-efficacy, and exercise self-efficacy. There was a significant decrease in state and trait anxiety.

A correlation matrix of the differences in the predictive variable scores in Table 7 was obtained (Table 8). A high moderate positive correlation (.69) was found between the difference in support and the difference in satisfaction with support (Hinkle, Wiersma, & Jurs, 1988). There were no other significant correlations.

A factor analysis for the four predicting constructs (CAD knowledge, anxiety, social support, and self-efficacy) was completed using SUPPPRE (POS) AND SATSPPRE (POS) to represent social support and satisfaction with social support. The factor analysis incorporated principle component analysis and varimax rotation. Eight components (factors as shown in Table 7) had eigenvalues

greater than 1 and were retained by the Kaiser criterion. The eight components explained 76.4% of the variance. Adaptive behavior variables were characterized by three of the factors: Factor 1 (smoking), Factor 4 (exercise), and Factor 5 (diet) (Appendix Q).

Table 7

Differences on Test Scores

Measurement	Pre-M	Post-M	Difference	t	p value
CADK	14.88	16.67	-.79	-4.31	.000
ANXST	29.48	24.10	5.37	4.59	.000
ANXTR	30.45	26.28	4.17	4.33	.000
SUPP	43.44	41.79	1.65	1.45	.152
SATSP	13.39	13.13	.26	.98	.330
SEFDT	4.19	4.57	-.38	-6.89	.000
SEFEX	3.66	3.91	-.25	-2.70	.008
SEFSM[a]	61.50	66.17	-4.67	-1.16	.258

CADK = CAD knowledge

ANXST = anxiety state

ANXTR = anxiety trait

SUPP = support

SEFSM = self-efficacy for smoking

SATSP = satisfied with support

SEFDT = self-efficacy for diet

SEFEX = self-efficacy for exercise

(N = 82).

[a]n = 24.

The first factor, the smoking factor, was reflected by smoking self-efficacy at both times of measurement, the

Table 8

Correlation of Predictive Difference Scores

Measurement	CADDIF	ANXSDIF	ANXTDIF	SUPDIF
CADDIF	1.00	-.02	-.00	.04
ANXSDIF	-.02	1.00	.15	-.07
ANXTDIF	-.00	.15	1.00	-.12
SUPDIF	.04	.06	-.12	1.00
SATDIF	-.05	-.13	-.33	.69
SEFDDIF	-.02	-.29	-.14	.21
SEFEDIF	-.18	-.21	-.22	.12
SEFSDIF	.23	.07	.10	.00

CADDIF = CAD knowledge difference

ANXSDIF = anxiety state difference

ANXTDIF = anxiety trait difference

SUPDIF = support difference

SATDIF = satisfied with support difference

SEFDDIF = self-efficacy for diet difference

SEFEDIF = self-efficacy for exercise difference

SEFSDIF = self-efficacy for smoking difference

(N = 82).

amount of smoking at both times, and the difference in the amount of smoking between measurements. The second factor, the exercise factor, consisted of exercise self-efficacy and the amount of exercise measured postdischarge and the difference in the amount of exercise pre- and post-PTCA. Diet, the third factor, consisted of diet self-efficacy at both times of measurement and the diet score postdischarge.

Since only the second measurement of the predictive variables was consistently associated with the adaptive behavior, it was considered the most reliable measurement associated with adaptation. The remaining factors consisting of predictive measurements taken in the hospital were not interpreted because they did not add any additional information helpful in analysis of adaptive behaviors.

An additional factor analysis on the predifferences and postdifferences on the four predicting constructs was conducted. Three eigenvalues were greater than 1: 2.15 (26.9%), 1.29 (16.1%), and 1.19 (14.8%); total 57.9%. Varimax rotation revealed the following factor loadings (Table 9) suggesting three factors (Factor 1: support, Factor 2: anxiety/self-efficacy for diet and exercise, and Factor 3: CAD knowledge/self-efficacy for smoking) among the four predictive variables.

The factor analysis of the difference in the scores of the predictor variables suggests that there was an association between support change and a change in the satisfaction with support. A decrease in state anxiety was associated with an increase in subjects' diet self-efficacy and exercise self-efficacy. An increase in CAD knowledge was associated with an increase in smoking self-efficacy.

Adaptive Behaviors

When subjects were questioned 6 to 8 weeks after discharge about changes in their adaptive health behaviors, mosteported some changes, with only 1 subject reporting no

change in his diet, exercise, or smoking habits (Table 10). Of the 24 subjects who smoked, all except 1 subject decreased or stopped smoking 6 to 8 weeks after discharge.

Table 9

Factor Analysis of Differences

Variable	Factor 1	Factor 2	Factor 3
CADDIF	.08	-.08	.79
ANXSDIF	-.00	-.73	-.06
ANXTDIF	-.34	-.40	.13
SUPDIF	.88	.05	.08
SATDIF	.91	.13	-.11
SEFDDIF	.24	.63	.07
SEFEDIF	-.02	.68	-.16
SEFSDIF	-.13	.02	.75

CADDIF = CAD knowledge difference

ANXSDIF = anxiety state difference

ANXTDIF = anxiety trait difference

SUPDIF = support difference

SATDIF = satisfied with support difference

SEFDDIF = self-efficacy for diet difference

SEFEDIF = self-efficacy for exercise difference

SEFSDIF = self-efficacy for smoking difference

(N = 82).

Since this was a small sample it lowered the power of the statistic and increaseed the danger of committing a Type II error. Subjects indicated on a 5-point Likert scale that knowledge level and physical well-being were the primary

factors influencing their decision to change their behavior to help cope with heart disease (Table 11).

Table 10

Adaptive Health Changes

Adaptive change	Frequency	Percentage
Diet change	63	76.8
Exercise change	50	61.0
Smoking change[a]	23	95.8

(N = 82).

[a]n = 24.

Table 11

Factors Influencing Behavior Change

Factor	M	SD
Knowledge level	4.66	1.01
Physical well-being	4.65	1.10
Spiritual	2.99	1.89
Emotional well-being	2.47	1.80

(N = 77).

Complications were examined in subjects and patients who chose not to participate in the study or withdrew from the study. Subjects were questioned on follow up at 6 to 8 weeks after discharge with regard to any problems they were having at that time, and hospital charts were reviewed for persons refusing to participate in the study and those who withdrew (Table 12). Subjects reported fewer complications (13.4%, n = 82) than others who declined or withdrew (16.7%, n = 12). Two subjects had both a repeat PTCA and a CABG by

the time of the second data collection. One subject who withdrew had a repeat PTCA and CABG, and later died. After the 6- to 8-week data collection, it was incidentally discovered that 2 subjects who reported no problems and 1 subject who reported shortness of breath had a repeat PTCA later in time. Two of the nonparticipants had complications after the 6 to 8 weeks. One had a repeat PTCA, and the other had both a repeat PTCA and a CABG.

Table 12

Complications at 6 to 8 Weeks After Discharge

Complication	Number	Percentage
	Subjects (N = 82)	
Chest pain	3	3.7
Weak/SOB	2	2.4
Repeat PTCA	5	6.1
CABG	3	3.7
	Nonparticipants/withdrew (n = 12)	
Weak/SOB	1	8.3
Repeat PTCA	1	8.3
CABG	1	8.3
Death	1	8.3

Food Frequency Checklist Reliability

A subsample of 10 subjects was selected to check for the reliability of data collected on the Food Frequency Checklist. These subjects were asked if the categories of food listed on the checklist included the foods they usually eat and if they were able to give accurate information about

their diet through the use of the Food Frequency Checklist (Appendix J). All of the subsample (100%, $\underline{n}$ = 10) responded "yes" to these questions.

Hypothesis Testing

The hypothesis, H_A: Adaptive behaviors of diet modification, exercise, and cigarette smoking can be predicted or characterized by CAD knowledge, anxiety, social support, and self-efficacy.

To examine the relationship between the predictive variables of CAD knowledge, anxiety, social support, and self-efficacy and the dependent adaptive variables of diet, exercise and smoking, a deductive pattern of inquiry was used. Stepwise regression followed by canonical correlation was used to examine the relationship.

Multivariate Associations

Multiple regression: diet 6 to 8 weeks after discharge. In this sample 24% ($\underline{R}^2$ = .24, $\underline{p}$ = .00005) of the variability of the postdiet scores was attributed to postdiet self-efficacy. Thirty-five percent ($\underline{R}^2$ = .35, $\underline{p}$ = .0016) of the variance of postdiet scores was contributed to the combined variance of diet self-efficacy and postcoronary artery disease knowledge. Four other variables explained an additional increase of 15% of the variance of postdiet scores. These were postself-efficacy for smoking scores ($\underline{R}^2$ increase = .40, $\underline{p}$ = .0086), preself-efficacy for exercise scores ($\underline{R}^2$ increase = .43, $\underline{p}$ = .0032), pretrait anxiety scores ($\underline{R}^2$ increase = .47, $\underline{p}$ = .0131), and

postsatisfaction for support (R^2 increase = .50, p = .0253). These six predictors accounted for 50% of the variance in the posttest diet scores.

Multiple regression: exercise 6 to 8 weeks after discharge. In this sample 20% (R^2 = .20, p = .0001, n = 71) of the postexercise variance was attributed to postexercise self-efficacy. No other relationship was found between the other predictor variables and the amount of exercise reported by the subjects.

Multiple regression: smoking at 6 to 8 weeks after discharge. Fifty-four percent (R^2 = .54, p = .0002, n = 24) of the postsmoking variance was attributed to postsmoking self-efficacy. No other predictor variables contributed to a difference in smoking.

Canonical correlations. Results suggested two theoretically and statistically significant canonical correlations. The Roy's Greatest Root equaled .666. The first canonical correlation (CR = .631) with an associated lambda of .66 accounted for 68% of the variance. The likelihood ratio of .457 produced an F statistic of 3.11, df = 18,175.85, p = .0001. The CR2 = .473; λ = .289 accounting for 29% of the variance. The likelihood ratio is .762 producing an F statistic of 1.84, df = 10,126, p = .061. Ninety-seven percent of the variance across the predictive and adaptive variables was accounted for by the two canonical variables (CV1 & CV2). The predictive variable and adaptive variable loadings on the first and second canonical variants are

included in Table 13.

Table 13

Canonical Correlation Loadings

Predictive variables	CV1	CV2
CADKPOS	-.262	+.571
ANXSTPOS	-.528	+.125
SUPPPOS	+.352	+.202
SEFDTPOS	+.476	+.294
SEFEXPOS	+.453	+.662
SEFSMPOS	+.606	-.388
Adaptive variables	**CV1**	**CV2**
DIETDIF	+.129	+.333
EXERDIF	+.601	+.755
SMOKDIF	-.836	+.549

CADKPOS = postCAD knowledge

ANXSTPOS = postanxiety state

SEFDTPOS = self-efficacy for postdiet

SEFEXPOS = self-efficacy for postexercise

SMOKDIF = smoking difference

SEFSMPOS = self-efficacy for postsmoking

SUPPOS = postsupport

DIETDIF = diet difference

EXERDIF = exercise difference

The results were supportive of the hypothesis of a relationship between the predictive and adaptive variables. The first canonical variable contrasts anxiety with self-efficacy; postCAD knowledge was unrelated to the canonical variable. The first canonical variable for the adaptive

scores reflect greater exercise and less smoking. The first canonical correlation therefore suggests that subjects with higher self-efficacy scores and less anxiety improved their exercise and smoking behaviors.

The second canonical variable appears to reflect subjects who have difficulty with smoking but show increases in their knowledge and exercise self-efficacy and who improve their exercise behavior. The canonical variable for the predictive variables associates improvement in knowledge and exercise self-efficacy, and it contrasts these with a decrease in smoking self-efficacy. The canonical variable for the adaptive behaviors contrasts the rate of improvement in exercise versus smoking. Although all subjects who smoked tended to improve on the smoking adaptive behavior, the rate of the improvement tends to differ among the subjects and it is this that the second canonical variable appears to reflect.

Univariate Asociations

Correlations. For exercise (n = 71) there was a low positive correlation (r = .44, p < .001) between postself-efficacy exercise scores and exercise scores. No other significant correlations were found.

For diet a moderate positive correlation (r = .49, p <.001) was obtained between diet self-efficacy scores (6 to 8 weeks after discharge) and postdiet scores. Low positive correlations were also found between coronary artery disease knowledge (6 to 8 weeks after discharge) (r = .37, p <

.001), diet self-efficacy scores in the hospital (r = .40, p < .001), and prediet (r = .35, p < .001) with postdiet.

For smoking (n = 24) there was a high negative association between the self-efficacy and the amount of cigarette smoking (r = -.73, p < .001) 6 to 8 weeks after discharge. The higher the smoking self-efficacy score indicating subjects' confidences in not smoking, the less the number of cigarettes they smoked. There was a high correlation between the smoking amount in the hospital and the difference in the amount subjects smoked between the two times of measurement (r = .80, p <.001). The more the subjects smoked in the hospital, the greater the decrease in the amount of cigarettes smoked at 6 to 8 weeks after discharge. No significant correlation occurred between presmoking and postsmoking self-efficacy (r = .42).

Multiple regression demonstrated some relationship between the predictive variables of CAD knowledge, anxiety, social support, and self-efficacy with adaptive health behaviors of diet modification, exercise, and smoking. Self-efficacy scores were consistently related to all three adaptive health behaviors. Self-efficacy also correlated with all the adaptive behaviors examined. Stepwise multiple regression demonstrated a relationship of a lesser degree between CAD knowledge and diet modification. The relationship between these variables was supported by an association with correlation analysis.

t Tests. The t Tests were done to determine if there was a

difference in the mean scores of the predictive and adaptive variables at the two times of measurement. This was the first PTCA for the subjects, and the majority of subjects had not been diagnosed with a heart condition prior to the admission when the first measurements were taken. The PTCA experience may have influenced changes in the predictive and adaptive variables.

Changes in Predictive Behavior

There was a significant difference in the subjects' coronary artery disease knowledge scores at the time of hospitalization (pre) and 6 to 8 weeks postdischarge (post) ($\underline{x}$ pre = 14.88, $\underline{x}$ post = 16.67, $\underline{t}$ value = -4.31, $\underline{df}$ = 81, $\underline{p}$ < .0005, $\underline{r}$ = .604) indicating an increase in their CAD knowledge score. The reasons for this increase in knowledge were not identified but patient education is practiced by the nurses in this hospital setting as part of the routine care.

There was a significant difference between state anxiety scores in the hospital and 6 to 8 weeks postdischarge ($\underline{x}$ pre = 29.48, $\underline{x}$ post = 24.10, $\underline{t}$ value = 4.59, $\underline{df}$ = 81, $\underline{p}$ < .0005, $\underline{r}$ = .414) indicating a decrease in state anxiety scores.

There was a significant difference between trait anxiety scores at the two times of measurement ($\underline{x}$ pre = 30.45, $\underline{x}$ post = 26.28, $\underline{t}$ value = 4.33, $\underline{df}$ = 81, $\underline{p}$ <.0005, $\underline{r}$ = .635) indicating a decrease in trait anxiety scores. No explanation for the decrease in trait anxiety was found. It

may have had some relationship to the subjects' physical discomforts and their concern abut their physical well-being while they were in the hospital. Subject testing in validity studies on the STAI, Form Y were not in an acute anxiety condition over a cardiac procedure (Spielberger, 1983). This places some question of the validity between state anxiety and trait anxiety.

No significance difference in support was found between hospitalization and 6 to 8 weeks postdischarge ($\underline{x}$ pre = 43.44, $\underline{x}$ post = 41.62, $\underline{t}$ value = 1.45, $\underline{df}$ = 81, $\underline{p}$ = .152, $\underline{r}$ = .720). No significant difference was found between satisfaction with support at the time of hospitalization and 6 to 8 weeks postdischarge ($\underline{x}$ pre = 13.39, $\underline{x}$ post = 13.13, $\underline{t}$ value = .98, $\underline{df}$ = 81, $\underline{p}$ = .330, $\underline{r}$ = .522).

There was a significant difference in the diet self-efficacy scores at the time of hospitalization and 6 to 8 weeks postdischarge ($\underline{x}$ pre = 4.19, $\underline{x}$ post = 4.57, $\underline{t}$ value = -6.89, $\underline{df}$ = 81, $\underline{p}$ <.0005, $\underline{r}$ = .557) indicating an increase in the diet self-efficacy scores.

There was a significant difference in exercise self-efficacy scores between the two measurements ($\underline{x}$ pre = 3.66, $\underline{x}$ post = 3.91, $\underline{t}$ value = - 2.70, $\underline{df}$ = 81, $\underline{p}$ = .008, $\underline{r}$ = .541) indicating an increase in exercise self-efficacy scores.

No significance was obtained between smoking self-efficacy scores during hospitalization and 6 to 8 weeks postdischarge ($\underline{x}$ pre = 61.50, $\underline{x}$ post = 66.17, $\underline{t}$ value =

-1.16, df = 23, p = .258, r = .421). The small sample size may account for no significance. No interpretation is appropriate for apparent random results.

Changes in Adaptive Behavior

There was a significant difference in the subjects' diet scores at the time of hospitalization and 6 to 8 weeks after discharge (x pre = 115.18, x post = 123.34, t value = 10.17, df = 81, p <.0005, r = .350) indicating an increase in adherence to a low fat diet.

There was a significant difference in the exercise scores of subjects between the time of hospitalization and 6 to 8 weeks after discharge (x pre = .69, x post = 5.01, t value = -9.40, df = 70, p < .0005, r = .288) indicating an increase in exercise type and frequency.

The difference between presmoking and postsmoking was significant (x pre = 2.72, x post = .79, t value = 6.71, df = 23, p < .0005, r = .311) indicating a significant decrease in the amount of cigarettes smoked per day.

Summary

The hypothesis, H_A: Adaptive behaviors of diet modification, exercise, and cigarette smoking can be predicted or characterized by CAD knowledge, anxiety, social support and self-efficacy, was partially supported. Self-efficacy was the single most predictive factor that was consistently related to adaptive behavior. Self-efficacy does not completely explain smoking. Since self-efficacy is a trait measure and behavior is a state, smoking could

relate to a number of variables. Subjects demonstrated a change in all three adaptive health behaviors examined, that included diet modification, exercise, and smoking. In addition, the four predictive variables of CAD knowledge, anxiety, social support, and self-efficacy had an influence on one or more of the adaptive health behaviors. Anxiety in combination with self-efficacy was found to have the most significant relationship with change in the subjects' adaptive behaviors. Measurements taken at 6 to 8 weeks postdischarge were most consistently related to adaptive health behaviors.

Results suggested that subjects improved in their adaptive behavior in general. Canonical correlation revealed two personality characteristics involved in adaptive changes. An increase in self-efficacy and a decrease in state anxiety was associated with an improvement in smoking and exercise.

A second personality dynamic suggested a group of people who improved their general CAD knowledge but their self-efficacy for smoking was not increased. These people tended to improve their exercise, but did not markedly change their smoking behavior.

CHAPTER V

Discussion, Conclusions, Implications, and Recommendations

The purpose of this study was to determine what influences CAD knowledge, anxiety, social support, and self-efficacy have on the adaptive health behaviors of patients treated with a PTCA. The adaptive health behaviors examined were diet modification, exercise, and smoking.

Discussion

The findings relevant to the review of literature and research are addressed in relation to the predictive and adaptive variables. They are discussed in relation to the findings collected both in the hospital and 6 to 8 weeks postdischarge.

Literature supports and research findings validate the positive effects of educational programs for cardiac patients (Daumer & Miller, 1992; Miller et al., 1988; Thompson, 1989; Thompson & Cordle, 1988). In the current sample there was an increase in CAD knowledge of subjects between the time of hospitalization and 6 to 8 weeks postdischarge. The increase in CAD knowledge may be due to education from nurses and other members of the health team in the hospital or after discharge. In data collected

subjects reported that knowledge level along with physical well-being were the primary factors influencing their decisions to adapt their behavior. However, the increase in CAD knowledge did not have a significant effect on all three adaptive behaviors examined. An increase in exercise was associated with an increase in CAD knowledge, and the subjects who improved their general CAD knowledge tended to exercise more frequently. However, subjects who smoked tended to not increase their confidence in not smoking (self-efficacy) even though their CAD knowledge increased. Even though subjects decreased the amount they smoked, usually their self-efficacy for smoking avoidance did not markedly change. Situations that subjects reported were problematic for smoking abstainence did not change after their PTCAs. Smokers reported having the same desire to smoke but these inclinations to smoke were inhibited by the alternative desire to stay alive. This new desire was made salient by their medical condition and stronger social prohibition by medical professionals and often their family.

It is possible that the benefits of exercise were a positive outcome of their educational programs associated with hospitalization and rehabilitation. Exercise is encouraged for patients treated with a PTCA in the hospital where the sample was obtained.

In the present study, subjects had a significant decrease in both state and trait anxiety between the two times of measurement. An association between anxiety and

self-efficacy was found. As state anxiety decreased from measurement in the hospital to 6 to 8 weeks postdischarge, diet self-efficacy and exercise self-efficacy increased. This is consistent with Stretcher and co-workers' (1985) study examining smoker's self-efficacy and anxiety. They found that a high self-efficacy was related to a low anxiety level.

In general, social support in the present study did not significantly change between measurement in the hospital and 6 to 8 weeks postdischarge, nor did satisfaction with support. There was, however, a significant difference in communication frequency. The number of times and minutes subjects spent talking with their spouse or significant other decreased at the postdischarge testing. The subjects may have talked more to their spouse or significant other because their anxiety was increased. This may also suggest that time communicating at second measurement may have been more reflective of their usual pattern since other types of support measured by the PSI did not indicate a change in support.

Firth and Dracup (1992) noted a relationship between high degrees of social support and less anxiety in a study on 33 cardiac patients. In the present sample of 82 subjects, this was not supported. No correlation was found between social support and anxiety or any other predictive variable examined.

A high self-efficacy has been associated with a low level of anxiety (Dennis, 1987; Stretcher et al., 1985). In the present study an increase in self-efficacy for smoking and exercise was associated with a decrease in state anxiety. Subjects seemed to have more confidence in their ability to adapt their behaviors when their anxiety level was decreased. Furthermore, there was a significant increase in self-efficacy for diet and exercise between measurements taken in the hospital and 6 to 8 weeks postdischarge. The cause for this increase may have been related to mastery of diet and exercise adaptive behaviors. Although subjects reported a decrease in smoking amounts, no significant difference was noted in smoking self-efficacy at 6 to 8 weeks postdischarge. This seems related to their tendency to smoke under the same circumstances.

Stretcher et al. (1986) found a strong relationship between weight control and self-efficacy. Although no research studies were found relating adherence to a low fat diet and self-efficacy, this study found a significant increase in subjects' adherences to a low fat diet when measured 6 to 8 weeks postdischarge. Stepwise multiple regression, factor analysis, and univariate associations identified a significant association between diet self-efficacy and adaptation to a more low fat diet. An association between diet modification and diet self-efficacy was not found with canonical correlation in the present study. This finding is most likely due to the small

sample size in this present study. Canonical analysis may have disclosed this relationship with a larger sample size.

There was a significant increase in exercise type and frequency between the two times of measurement. This finding is consistent with previous studies noting an increase in exercise capacity and level of physical activity in PTCA patients (Gruentzig et al., 1987; Papadantonaki et al., 1994; Parisi, Follard, & Hartigan, 1992). Because there was no intervention in the present study, the increase in exercise is most likely due to the experience of their first PTCA. In addition, the majority of the subjects were first diagnosed with heart disease. Numerous variables that were not accounted for may have influenced this increase in exercise. The acute nature of their heart disease may have resulted in a close examination of their lifestyle and a conscious increase in exercise or teaching done by the hospital staff.

Gortner et al. (1988) found a significant increase in cardiac surgery patient's self-efficacy at 8 weeks postoperatively after a cardiac rehabilitation teaching program. Taylor et al. (1985) also found an increase in cardiac subject's self-efficacy after treadmill testing and counseling. Robertson and Keller's (1992) study found subjects with a higher self-efficacy had more adherence to their exercise regimen. In this study the relationship between exercise self-efficacy and amount of exercise was supported with canonical correlation, stepwise multiple

regression, factor analysis, and correlations. The increase in exercise was associated with an increase in exercise self-efficacy and a decrease in state anxiety.

Studies indicate that patients who smoke are more likely to comply with cessation advice at the time of hospitalization for heart disease (Rigotti, McKool, & Shiffman, 1994). In this study there was a significant decrease in the amount of cigarettes smoked by subjects between the two times of measurement.

Social support has been associated with cessation of smoking (Coppotelli & Orleans, 1985; Mermelstein et al., 1986). Stretcher and co-workers' (1985) study found a high self-efficacy for smoking was related to a low level of anxiety and a high level of social support. Kelly et al. (1991) also found a relationship between decreased smoking and smoking self-efficacy, but did not find an association between social support and decreased smoking. This study supported previous findings of a relationship between a high smoking self-efficacy and a decrease in the amount of cigarettes smoked. In the present study an increase in smoking self-efficacy and a decrease in state anxiety was associated with less smoking.

Subjects improved in their adaptive behaviors with self-efficacy, consistently characterizing these positive behavior changes. The stepwise multiple regressions, although interesting from an actuarial perspective, tended to obscure meaningful clinical information disclosed by the

canonical analysis. Specifically, the role of anxiety is suppressed in stepwise regression because of its actuarial redundancy with the other predictors. Clinically, however, the canonical correlations suggest anxiety and self-efficacy form contrasting parallel processes, and only further experimental research would determine any causal factor between self-efficacy and anxiety.

CAD knowledge, measured by the Coronary Angioplasty Risk Factor Inventory, Form 3 (CARFI); state and trait anxiety measured by the State-Trait Anxiety Inventory, Form Y; self-efficacy measured by the Cardiac Diet Self-Efficacy Instrument (CDSEI); the Cardiac Exercise Self-Efficacy Instrument (CESEI); and the Self-Efficacy for Smoking Behavior, were easily administered and scored. A mean or total score was obtained on these instruments.

The Perceived Support Inventory (Version A) was difficult to score due to the nature of the tool, which identified four different aspects of social support. A total score or mean score could not be obtained. However, useful data specifically identifying supportive measures from a spouse or significant other were included, making this tool more applicable to this study than other social support instruments reviewed.

The Food Frequency Checklist and the Exercise Frequency Checklist were easily administered and scored with the Likert-type scales applied to the instruments. No tool was

found that would examine a low fat diet using an interval scale. Smoking was easily measured with a total score of the number of cigarettes.

The number of instruments used to obtain data at times presented a problem, because data collection lasted longer than anticipated, averaging 45 min. at a time. The subjects' short hospital stays were problematic for data collection. The subjects were often admitted on an outpatient basis and discharged the following day. Much of the time during their hospitalization they were physically uncomfortable due to the PTCA. This may have influenced their state and trait anxiety scores measured at that time, resulting in unreliably high scores.

The subjects often explained their responses and told stories of personal experiences relating to their illnesses and recoveries. A limitation of this study was the inability to capture the personal meaning of the PTCA experience of the subjects.

Roy's Adaptation Model (Roy & Andrews, 1991) was the framework that guided this study. The model addresses adaptation in terms of adaptive and ineffective responses. The patients treated with a PTCA are faced with a need to examine lifestyles and health behaviors and to adapt to the changes required. Roy's model (Roy & Andrews, 1991) was helpful in identification of stimuli influencing the subjects. Focal and contextual stimuli were identified based on environmental concepts in the model.

In Roy's model (Roy, & Andrews, 1991), the four adaptive modes are reviewed separately; yet, they are interrelated and behavior in one mode may act as a stimulus in another mode. In this study the self-concept mode represented by self-efficacy was influenced by the role function mode represented by anxiety. This framework provided direction for planning the methodology for the study and analyzing the results according to adaptive or ineffective behaviors.

Bandura's (1986) Social Cognitive Theory was supported by the findings in this study. Self-efficacy was the most predictive variable for adaptive behavior in this sample of patients treated for the first time with a PTCA. Mastery as a powerful source of self-efficacy was supported in this study by an increase in self-efficacy, which was associated with adaptive health behaviors.

The links anticipated between the Roy Adaptation Model, social support, and Bandura's Social Cognitive Theory were not found in this study (Figure 3). The association identified between anxiety and self-efficacy was more direct than depicted in Figure 3. This study did not identify as association between self-efficacy and social support (Figure 4) as was anticipated at the onset of this study. In addition, numerous subjects volunteered additional comments that were not solicited by instruments used in this study.

Many subjects wanted to tell their "stories" about the PTCA experience for them and individual experiences related to the study variables.

Conclusions

The findings in this study partially support the hypothesis, H_A: Adaptive behaviors of diet modification, exercise, and cigarette smoking can be predicted or characterized by CAD knowledge, anxiety, social support, and self-efficacy.

The following conclusions were drawn from the findings of this study: (a) Subjects demonstrated a change in all three adaptive health behaviors examined of diet modification, exercise, and smoking; (b) the four predictive variables of CAD knowledge, anxiety, social support, and self-efficacy, had an influence on one or more of the adaptive health behaviors; (c) anxiety in combination with self-efficacy was found to have the most significant relationship with changes in the subjects' adaptive behaviors; and (d) self-efficacy was the single most significant predictive factor that was consistently related to the adaptive behaviors.

Implications

The findings in this study suggest: (a) Educators should emphasize the impact of stimuli and the role anxiety and self-efficacy have on patients treated with a PTCA, (b) nurses should emphasize the relationship of CAD knowledge and an increase in exercise in patients treated with a PTCA,

(c) nurses should assess anxiety and self-efficacy of patients treated with a PTCA and use these findings to plan care designed to assist patients in their rehabilitation and adaptation to cardiac disease, (d) patients with a low self-efficacy should have nursing care focused on increasing their self-efficacy as well as lowering their anxiety, (e) measures should be taken by nurses to decrease patients' anxiety while helping them increase their self-efficacy through planning tasks they can master, and (f) research guided by a theoretical framework to examine individuals' experiences associated with a PTCA and adaptive health behaviors should be conducted.

Recommendations

Based on the results of this study the following recommendations are made for nursing research, practice, and education.

Research

Based on the results of this study recommendations for future research include the following: (a) Replicate this study with a larger sample size using random selection to more clearly ascertain the relationship between self-efficacy and diet modification, (b) repeat this study with a longitudinal design to asertain the affect of the study variables at 6 months, (c) conduct studies using quantitative research to examine the relationship of CAD knowledge and diet modification, (d) apply further research to examine the influences of anxiety and CAD knowledge on

adaptive health behaviors, (e) include more quantitative research using a large sample to examine the influence of self-efficacy on smoking reduction in patients with a PTCA, (f) conduct clinical trials to examine if a decrease in anxiety would result in an increase in self-efficacy, (g) use qualitative research to investigate individuals' perceptions of anxiety and self-efficacy associated with PTCA and CAD, (h) use qualitative research to identify patients' perceptions of adaptive or ineffective health behaviors after a PTCA, (i) conduct qualitative research to identify individuals' perceptions of the influence of social support on adaptive health behaviors, (j) investigate factors that may increase individuals' self-efficacy without increasing their anxiety, (k) investigate other variables that may influence adaptive health behaviors as depression, (l) conduct research in tool development for screening procedures of cardiac patients to identify specific deficiencies in self-efficacy, (m) conduct research in diet tool development for measurement of fat content of foods, and (n) conduct research in exercise tool development for measurement of type and frequency of exercise.

Practice

Based on the results of this study the following recommendations are made for nursing practice: (a) Use of screening procedures to identify anxiety and self-efficacy levels in patients treated with a PTCA, (b) plan nursing interventions to increase self-efficacy in

patients identified with a low level of self-efficacy, and (c) use self-efficacy check-lists at intervals during cardiac rehabilitation to help plan mastery of adaptive behavior tasks.

Nursing Education

Based on the results of this study the following recommendations are made for nursing education: (a) Emphasize to students the importance of self-efficacy in the mastery of adaptive health behaviors of patients treated with a PTCA, (b) encourage students to use nursing models to guide their practice and research, and (c) disseminate the results of this study to students exploring research in adaptive behaviors of cardiac patients.

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APPENDICES

Appendix A

SUBJECTS IN RESEARCH ON SOCIAL SUPPORT

Demographic Variable	Number	Percent
Subject		
Patient	20	55.5
Spouse	6	16.7
Both	6	16.7
Spouse and other	4	11.1
Age		
18-65	4	11.1
66 and older	3	8.3
Not specified	6	16.7
Combination	23	63.9
Gender		
Female	5	13.9
Male	4	11.1
Both	27	75.0
Culture		
Caucasian	5	13.9
Other	1	2.8
Combination	4	11.1
Not specified	26	72.2
Socioeconomic status		
Combination of high, medium and low levels	14	38.9
Not specified	22	61.1

SUBJECTS IN RESEARCH ON SOCIAL SUPPORT (cont.)

Demographic Variable	Number	Percent
Education		
Combination of grade school, high school, and college	20	55.6
Not stated	16	44.4
Marital status		
Married	10	27.8
Combination of single and Married	16	44.4
Not Stated	10	27.8
Patient Diagnosis		
Myocardial Infarction	15	41.6
Cardiac Catheterization	1	2.8
Coronary Artery Bypass Surgery	9	25.0
Cardiac Transplant	1	2.8
Other	5	13.9
Combination	5	13.9

(N = 36).

Appendix B

SUBJECT DEMOGRAPHIC DATA FORM

ID Number_____ Participation in Study: Agree___ Decline___

Age_____ Sex:_____(Male) _____(Female)

Race:_____(Caucasian) _____(Black) _____(Hispanic)
_____(Asian) _____(Other)

Marital Status:_____(Married) _____(Single)
_____(Divorced) _____(Widowed)

Educational Level:
_____Less than high school
_____High school graduate
_____Attended college but did not graduate
_____College graduate

Occupation:_____

Previous Hospitalizations:
_____Previously admitted to the hospital
_____Previous admission to the Coronary Care Unit
_____Previously diagnosed with heart condition prior to this admission
_____ Previous PTCA _____Number of Previous PTCA
_____Previous CABG

Risk Factors for CAD
_____Previous Adherence to a Special Diet _____Type

Previous Exercise Pattern:
_____No Previous Exercise
_____Exercise of Walking Less Than Three Times a Week
_____Exercise of Walking Three or More Times a Week
_____Aerobic Exercise Less Than Three Times a Week ____Type

_____Previous History of Smoking _____Pack Year History

_____ID Number Subject's Name:_____
_____Subject Spouse or Significant Other's Name:_____
_____Declined
to Participate

Address:_____
_____
_____

Phone Number:_____

Date of PTCA:_____

Date of Discharge After PTCA:_____

Convenient Time to Call for Follow Up:_____

Complications Requiring More Frequent Visits to Physician or Hospitalization:_____
_____
_____

Appendix C

THE CORONARY ANGIOPLASTY - RISK FACTOR INVENTORY

Patient ID Number _____
Date _____

Please answer the following questions. Don't worry if you do not know the correct answer. We are trying to find out what patients know about coronary angioplasty so we can develop better ways to prepare them for the procedure. We appreciate you cooperation in helping us with this effort.

PLEASE NOTE: Answer these questions with the knowledge you currently have. Please do not consult books or persons you feel might know the answers. We are not testing you to find out what you as an individual know, but we are interested in what all patients generally know after they have been through our program. Thank you for helping us in this.

Indicate whether you think the following statements are True (T) or False (F) and circle the appropriate letter (T or F) in the left hand collum:

T F 1) Plaque found in the coronary arteries is usually made of very hard material.
T F 2) Patients who continue to smoke, after angioplasty are at a higher risk for having renarrowing of the dilated artery.
T F 3) Attempting to decrease the stress and strain in one's life can be helpful in slowing down the clogging of the arteries.
T F 4) Even if you have been smoking for along time, quitting now will still probably help.
T F 5) One should wait at least a month after angioplasty before beginning a physical exercise program.
T F 6) All factors that increase the risk of coronary artery disease can be changed.
T F 7) Patients may go back to work the day after they return home for the hospital after having coronary angioplasty.
T F 8) It is recommended that angioplasty patients have a exercise treadmill test and their blood pressure monitored every month for the first 6 months after the angioplasty.
T F 9) The cholesterol level in our system is determined both by the kinds of food we eat and by our liver function.
T F 10) One of the ways in which both stress and smoking are dangerous is that both can lead to coronary artery spasms.
T F 11) Angina is a pain that signals the occurrence of some permanent damage to the heart.

T F 12) It is almost impossible to tell the difference between angina pain and pain that is associated with the occurrence of a heart attack.

T F 13) Pain associated with a heart attack is different from angina pain in that it is not usually relieved by resting.

T F 14) Both saturated and unsaturated fats should be limited by people who have coronary artery disease.

T F 15) Most canned food products should be limited because of the high salt content found in them.

T F 16) Fish, fowl, and liver are excellent foods for people who have coronary artery disease.

T F 17) Spices and herbs should be limited by people with coronary artery disease because these substances can elevate the blood pressure.

T F 18) Coronary Artery Disease is the most common disease in the United States today.

T F 20) Nitroglycerin should be renewed yearly.

21) Research has demonstrated that there are 3 major factors which increase one's risk for developing coronary artery disease, and which contribute to its progression. List the 3 factors below.

1._____

2._____

3._____

22) There are two categories of risk factors which contribute to the development and progression of coronary artery disease - those which can be changed, and those which can not be changed. Give two examples of each on the lines below.

Controllable Risk Factors	Non-Controllable Risk Factors
1._____	1._____
2._____	2._____

Appendix K

INTERVIEW QUESTIONS FORM

_____ID Number

Have you made any changes in your diet over the past month?_____ If so, what changes have you made?

_____

If so, why have you made these changes in your diet?

_____

Have you changed the amount that you exercise over the past month?_____
If so, what changes have you made?_____
If so, why have you made these changes in your exercise pattern?_____

What is the average number of cigarettes a day you have smoked over the past week?_____
Have you changed your smoking habits over the past month?_____
If so, why have you changed your smoking habits?_____

_____

Spouse or Significant Other: What is the average number of cigarettes a day your partner has smoked over the past week?

_____

If you have made any changes in your diet, exercise, or smoking behavior to help you cope with heart disease, how do each of the following factors influence your decision to change your behavior? Rate each of the following on a scale of 1 to 5, with 5 being quite a lot and 1 being very little.

VERY LITTLE				QUITE A LOT	
1	2	3	4	5	Physical well-being
1	2	3	4	5	Emotional well-being
1	2	3	4	5	Knowledge level
1	2	3	4	5	Spiritual

Appendix L

INTERVIEW FORM FOR SUBSAMPLE

ID Number_____

1. Do you eat different foods or prepare food differently now than you did before your PTCA? _____ Yes _____ No

2. If your diet is different now, how is it different?

_____
_____
_____
_____

3. Does the Food Frequency Checklist include the categories of food that you usually eat? _____ Yes _____ No

4. Do your responses on the Food Frequency Checklist include accurate information about your present diet?
_____ Yes _____ No

Appendix M

INFORMED CONSENT

Dear Subject,
The following information explains the study I am doing.

PURPOSE OF STUDY: I am a graduate student at the University of Alabama at Birmingham. As part of my education I am working on a study to identify patients' adaptation to coronary disease (CAD) after having a percutaneous coronary transluminal angioplasty (PTCA). This study is designed to provide information about how knowledge of CAD, anxiety, social support, and self-efficacy (what a person believes he can do) influences a person's adjustment of smoking, dietary, and exercise habits of a patient after a PTCA.

If you agree to participate in the study, I will have you: (1) give written consent, (2) complete questionnaires on CAD knowledge, anxiety, social support, self-efficacy, and answer interview questions about your smoking, dietary, and exercise habits, and (3) indicate on a food frequency checklist what types of food you have eaten in the past week and indicate on a physical activity checklist what exercise you have performed in the past month. Six to eight weeks after discharge from the hospital I will ask you to answer these same questions over the phone at a convenient time for you. This should take 20 - 30 minutes of your time in the hospital and 20 - 30 minutes on the phone six weeks after discharge.

Your participation in the study will not result in any direct benefit to you. However, results of the study will provide information that will be helpful to nurses in providing care to patients having a PTCA. No risks have been identified with this type of study, however, if you choose to withdraw from the study you may do so at any time.

Sincerely,

Barbara Rees

404 - 773-7668

I the undersigned have been given the chance to read the above description which includes the purpose, procedures, benefits and risks of the study. The investigator has gone over this explanation with me and I have been given a chance to ask any questions that I have about this study or the research procedures.

I understand that this is completely voluntary, that I do not have to participate in the study and I can stop at any time if I choose. My refusal to participate or withdraw from the study at a later time will have no effect on any regular services or benefits available to me at this facility.

The nature of this study has been explained to me and I have been given a copy of this statement.

DATE:_____ SIGNATURE OF SUBJECT: _____

DATE: _____ SIGNATURE OF INVESTIGATOR: _____

Appendix N

UAB FOOD FREQUENCY CHECKLIST, COMPOSITE SCORE SHEET

UAB SCHOOL OF MEDICINE
Division of Preventive Medicine
Composite Score Sheet
Executive Physical
Food Frequency Checklist

Check the frequency the following foods are consumed:	Never or less than 1 time/wk	1-2 times/wk	3-7 times/wk	More than once/d
Regular ground beef (serving)	4.3	3.0	2.0	1.0
Lean ground beef (serving)	4.3	3.7	2.7	1.7
Sausage, bacon, luncheon meat (piece)	4.7	3.3	2.3	1.3
Lean meats (round, flank, etc.) (serving)	4.7	3.7	2.7	2.3
High fat meats (prime rib, steak) (serving)	4.3	3.7	2.3	1.7
Poultry (piece)	2.7	3.3	4.3	3.7
Fish (serving)	2.3	3.3	4.3	4.0
Shellfish (serving)	3.3	3.3	2.7	2.3
Organ meats (liver, heart, brains, etc) (serving)	4.3	2.7	1.7	1.0
Beans (navy beans, black-eyed peas, soybeans, etc) (serving)	2.3	3.3	4.7	4.3
Peanut butter (tbsp)	4.3	3.3	2.3	1.3
Pizza (piece)	4.0	3.0	2.0	1.3
Whole milk (cup)	4.0	3.0	1.7	1.3
Cream (tbsp)	3.7	2.7	2.0	1.3
Nonfat milk (cup)	1.7	3.0	3.7	4.7
Hard cheese, cheese spread, regular cottage cheese (oz)	4.3	3.0	2.0	1.3
Cheese, low fat (oz)	2.7	3.3	3.3	3.7
Ice cream (1/2 cup)	4.7	3.3	2.0	1.0
Eggs (1)	4.7	3.3	2.0	1.3
Oils (in salad dressing, cooking, etc)	4.0	3.7	3.0	2.3
kind of oil (tbsp)	0	0	0	0
Butter (tsp or pat)	3.7	2.7	1.7	1.3
Margarine (tsp or pat)	4.7	4.0	3.0	2.7
Vegetables (serving)	1.7	2.7	4.0	5.0
Fruits (serving)	1.7	2.7	4.0	5.0
Fruit juice (cup)	1.7	2.7	4.0	5.0
Breads, white or whole grain (slice or roll)	1.7	2.7	4.0	5.0
Cereals (cup)	1.7	2.7	4.0	5.0
Pasta, noodles, rice, etc (cup)	1.7	2.7	4.0	5.0
Soft drinks (nondiet) (serving)	0	0	0	0
Snack crackers (serving)	4.3	3.0	2.0	1.3
Nut and seeds (1/4 cup)	4.3	3.3	2.3	1.3
Potato chips or corn chips (cups)	4.3	3.0	2.0	1.0
Sherbets and ices (1/2 cup)	3.7	3.0	2.7	1.7
Candy (1 to 1/2 oz)	4.0	3.3	2.3	1.7
Other foods, such as ethnic foods (Chinese, African-American, Mexican) LIST:	0	0	0	0

KEY: Very Good (5), Good (4), OK (3), Bad (2), Very Bad (1), NA (0)

FOR24 (0223) 6/25/93

Appendix O

DESCRIPTIVE STATISTICS FOR PRETEST AND POSTEST SCORES

Measurement	M	SD	se M	R
CAD knowledge (1)	14.98	4.43	.49	18
CAD knowledge (2)[a]	16.67	4.01	.44	17
Anxiety state (1)	29.48	11.48	1.27	41
Anxiety state (2)	24.10	6.63	.73	30
Anxiety trait (1)	30.45	11.27	1.25	56
Anxiety trait (2)	26.28	7.59	.84	38
Support (1)	43.44	12.31	1.36	54
Support (2)	41.79	14.62	1.62	75
Satisfied with support (1)	13.39	2.14	.24	12
Satisfied with support (2)	13.13	2.62	.29	12
Self-efficacy diet (1)	4.19	.57	.06	2.6
Self-efficacy diet (2)	4.57	.49	.05	2.2
Self-efficacy exercise (1)	3.66	.89	.10	3.5
Self-efficacy exercise(2)	3.91	.88	.10	3.5
Self-efficacy[b] smoking (1)	61.50	19.00	3.88	58
Self-efficacy[b] smoking (2)	66.17	17.59	3.59	58

DESCRIPTIVE STATISTICS FOR PRETEST AND POSTTEST SCORES (cont.)

Measurement	M	SD	se M	R
Diet (1)	115.18	6.28	.69	29.9
Diet (2)	123.34	6.45	.71	23
Exercise (1)[c]	.69	1.39	.17	9
Exercise (2)[c]	5.01	4.04	.48	13
Smoking (1)[b]	2.72	1.40	.29	5.7
Smoking (2)[b]	.80	.89	.18	3

Note. (1) = pretest, (2) = posttest. N = 82.

[a]n = 81. [b]n = 24. [c]n = 71.

Appendix P

CORRELATION OF DIFFERENCE SCORES ON PSI

Item #	1-3,14a-14c	4	5	6	7a	7b
1-3, 14a-14c	1.00	.54	.42	-.26	.04	-.23
4	.54	1.00	.30	-.34	.08	-.19
5	.42	.30	1.00	-.08	.11	-.06
6	-.26	-.34	-.08	1.00	-.01	.54
7a	.04	.08	.11	-.01	1.00	-.41
7b	-.23	-.19	-.06	.54	-.41	1.00
8a	-.01	-.14	.11	.03	-.14	-.23
8b	-.02	.07	.08	-.11	.08	-.05
9	.55	.59	.23	-.30	.09	-.23
10	.66	.57	.24	-.28	.12	-.19
11-12	.69	.60	.31	-.26	.15	-.20
13	.34	.46	.21	.07	.02	.01

Item #	8a	8b	9	10	11-12	13
1-3, 14a-14c	-.01	-.02	.55	.66	.69	.34
4	.14	.07	.59	.57	.60	.46
5	.11	.08	.23	.24	.31	.21
6	.03	-.11	-.30	-.28	-.26	.07
7a	-.14	.08	.09	.12	.15	.07
7b	.23	-.05	-.23	-.19	-.20	.01
8a	1.00	.08	-.06	-.15	-.18	-.08
8b	.08	1.00	.01	-.10	-.03	.14
9	-.06	.01	1.00	.75	.62	.33
10	-.15	-.10	.75	1.00	.90	.35

CORRELATION OF DIFFERENCE SCORES ON PSI (cont.)

Item #	8a	8b	9	10	11-12	13
11-12	-.18	-.03	.62	.90	1.00	.36
13	-.08	.14	.33	.35	.36	1.00

(N = 82).

Appendix Q

FACTOR ANALYSIS: PREDICTIVE & ADAPTIVE VARIABLES

Variable	Factor 1	Factor 2	Factor 3	Factor 4[a]
CADKPRE	.03	.08	-.03	.08
CADKPOS	.17	-.01	.12	.01
ANXSTPRE	-.06	-.25	.68	.20
ANXSTPOS	.12	-.33	.67	-.19
ANXTRPRE	.02	.00	.77	.07
ANXTRPOS	-.04	-.20	.83	-.11
SUPPPRE	-.10	.86	-.13	-.07
SUPPPOS	-.04	.82	-.22	.08
SATSPPRE	.05	.72	-.10	.00
SATSPPOS	-.05	.82	-.17	.17
SEFDTPRE	-.05	-.16	-.19	.02
SEFDTPOS	-.17	.04	-.02	.20
SEFEXPRE	-.03	-.01	-.33	-.04
SEFEXPOS	-.01	-.01	-.32	.46
SEFSMPRE	-.82	.08	-.02	.06
SEFSMPOS	-.82	-.00	.17	-.04
DIETPRE	-.18	.21	.11	.20
DIETPOS	-.21	.28	.21	.28
EXERPRE	.03	.00	-.04	.17
EXERPOS	-.04	.07	-.02	.96
SMAMTPRE	.93	-.04	.13	-.05
SMAMTPOS	.79	-.01	-.20	-.03
DIETDIF	-.03	.06	.09	.06

FACTOR ANALYSIS: PREDICTIVE & ADAPTIVE VARIABLES (cont.)

Variable	Factor 1	Factor 2	Factor 3	Factor 4[a]
EXERDIF	-.05	.06	-.01	.94
SMOKDIF	.76	-.05	.27	-.05
Variable	**Factor 5**	**Factor 6**	**Factor 7**	**Factor 8**
CADKPRE	-.11	.87	-.05	.06
CADKPOS	.19	.84	-.03	-.12
ANXSRPRE	-.09	.25	.11	-.18
ANXSTPOS	.01	.07	-.04	.07
ANXTRPRE	-.04	-.07	.02	-.19
ANXTRPOS	-.01	-.04	-.04	.12
SUPPPRE	-.02	.04	-.11	.13
SUPPPOS	-.13	.20	.08	-.15
SATSPPRE	.15	-.19	-.17	.34
SATSPPOS	.03	.01	.06	-.21
SEFDTPRE	.84	-.05	-.09	.03
SEFDTPOS	.74	-.02	.06	-.26
SEFEXPRE	.38	.38	.07	.47
SEFEXPOS	.17	.26	.06	.30
SEFSMPRE	.07	-.01	.11	-.12
SEFSMPOS	.24	.03	-.00	.01
DIETPRE	.30	.22	-.80	-.01
DIETPOS	.67	.30	.25	.07
EXERPRE	-.18	-.07	.05	.76
EXERPOS	.09	.01	-.05	.10
SMAMTPRE	-.01	.06	.09	-.03
SMAMTPOS	-.13	.17	.02	.01

FACTOR ANALYSIS: PREDICTIVE & ADAPTIVE VARIABLES (cont.)

Variable	Factor 5	Factor 6	Factor 7	Factor 8
DIETDIF	.33	.08	.91	.07
EXERDIF	.15	.03	-.07	-.20
SMOKDIF	.06	-.02	.10	-.04

CADPRE = CAD knowledge pretest

CADKPOS = CAD knowledge posttest

ANXSTPRE = anxiety state pretest

ANXSTPOS = anxiety state posttest

ANXTRPRE = anxiety trait pretest

ANXTRPOS = anxiety trait posttest

SUPPPRE = support pretest

SUPPPOS = support posttest

SATSPPRE = satisfied with support pretest

SATSPPOS = satisfied with support posttest

SEFDTPRE = self-efficacy for diet pretest

SEFDTPOS = self-efficacy for diet posttest

SEFEXPRE = self-efficacy for difference exercise pretest

SEFEXPOS = self-efficacy for exercise posttest

SEFSMPRE = self-efficacy for smoking pretest

SEFSMPOS = self-efficacy for smoking posttest

DIETPRE = diet pretest

DIETPOS = diet posttest

EXERPRE = exercise pretest

EXERPOS = exercise posttest

SMAMTPRE = smoking amount pretest

SMAMTPOS = smoking amount posttest

DIETDIF = diet difference

EXERDIF = exercise difference

SMOKDIF = smoking difference

(N = 82)

[a]n = 71.

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM

Name of Candidate Barbara Rees

Major Subject Adult Health Nursing

Title of Dissertation Influences of Coronary Artery Disease Knowledge Anxiety, Social Support, and Self-Efficacy on Adaptive Health Behaviors of Patients Treated with a PTCA

Dissertation Committee:

_____, Chairman

_____

_____

_____

_____

_____

_____

Director of Graduate Program _____

Dean, UAB Graduate School _____

Date 4/19/95

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