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**AN ASSESSMENT OF POST-PTCA PATIENTS' INTENTIONS TO REDUCE RISK
BEHAVIORS ASSOCIATED WITH CORONARY ARTERY DISEASE (CAD)**

by

WAJIH A. AHMAD

A DISSERTATION

**Submitted to the graduate school of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy**

BIRMINGHAM, ALABAMA

1997

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**ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM**

Degree Ph.D. Program Health Education/Promotion
Name of Candidate Wajih A. Ahmad
Committee Chairs David Macrina and Judith Taylor
Title An Assessment of Post-PTCA Patients' Intentions to Reduce Risk Behaviors
Associated with Coronary Artery Disease (CAD)

Cardiovascular disease remains the leading cause of death for both men and women in the United States. The purpose of this study was to assess patients' intentions to modify their behavior following the diagnosis of coronary artery disease (CAD) for which percutaneous transluminal coronary angioplasty (PTCA), more commonly known as balloon angioplasty, was recommended. Three risk behaviors, smoking, diet modification, and physical inactivity, were assessed. This study was designed and implemented at a southern university. An instrument to examine patients' intentions to modify their behavior post-PTCA was developed using the theory of planned behavior constructs. A sample population consisting of voluntary, self-selected patients was included in this study. Data were collected using a 52-item pre-PTCA questionnaire and a 52-item post-PTCA survey. Eleven demographic items were included. Sixty-eight patients who were admitted to the medical center for PTCA were interviewed.

A total of 36 males (28 Whites and 8 African Americans) and 32 females (28 Whites and 4 African Americans) was included in this study. The majority of patients revealed their intentions to quit smoking, become involved in physical activity, and modify their diet after the PTCA. Doctors were identified as the most influential in promoting smoking

cessation, while families were more influential in promoting physical activity and diet modification. No significant differences between males and females on their intentions to change their behavior were noted.

These findings indicate that patients undergoing PTCA revealed intentions to modify risk behaviors related to CAD; therefore, risk-reduction educational programs should be designed in a framework as part of a cardiac rehabilitation program. In addition, physician recommendations to modify behaviors should be strongly encouraged.

DEDICATION

I wish to dedicate this dissertation to my wife, Somayah, and my children, Ahmad, Rana, and Raed, whose love and support have enabled me to strive to a successful completion of my doctoral program; and to the honor of my mother and in memory of my father, for the wonderful life given to me where I found my life of learning. I could not have done this without you, and for that I will always be very much indebted to you.

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to members of my dissertation committee for all their support and guidance throughout this learning venture. I am deeply grateful to Dr. David Macrina, Chairman; Dr. Judy Taylor, Cochair; Drs. Larry Dean; Steve Nagy; Jim Mclean; and Bonnie Sanderson. Special thanks are extended to Dr. Judy Taylor. Her clarity of thought, contribution in editing, availability, and patience were much needed throughout this endeavor.

Most importantly, it is with the greatest love and gratitude that I thank my wife, Somayah, and my children, Ahmad, Rana, and Raed, who have provided love, words of encouragement, and patience. Your love and belief in me brought the inspiration I needed to complete this venture.

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LIST OF ABBREVIATIONS

AMI	Acute myocardial infarction
CAD	Coronary artery disease
CHD	Coronary heart disease
CABG	Coronary artery bypass grafting
IRB	Institutional review board
NHLBI	National heart, lung, and blood institute
PTCA	Percutaneous transluminal coronary angioplasty
TPB	Theory of planned behavior
TRA	Theory of reasoned action

CHAPTER 1

INTRODUCTION

Statement of the Problem

Percutaneous transluminal coronary angioplasty (PTCA) was introduced and developed by Gruentzing and coworkers in 1977. Since then, it has gained wide acceptance as an alternative to coronary artery bypass grafting (CABG) for selected patients with coronary artery disease (CAD). When first introduced, PTCA was limited to the correction of discrete noncalcified proximal coronary stenoses. Today, the procedure is being used in patients with multivessel disease, saphenous vein grafts, total coronary occlusions, and acute myocardial infarction (AMI) (Popma & Gregory, 1989). PTCA offers symptomatic relief, improved functional capacity, and enhanced quality of life for these and other patients (Parisi, Folland & Harigon, 1992; McKenna et al., 1994).

With continuing advancement in biomedical, technology, and knowledge, indications for PTCA have widened considerably. In many centers, there has been a significant improvement in the success rate and a decrease in major cardiac complications, despite the increased anatomic and pathologic complexity of vessels and lesions currently treated with PTCA (Myler, Shaw & Stertz, 1987). However, the progression of obstructive CAD among patients with previous PTCA appears to be less than those patients not treated by PTCA (Ohtani & Hiasa, 1995). Therefore, PTCA presents an attractive option and alternative to patients with severe CAD because of the shorter hospital stay, use of local

anesthesia, lower cost, and potential immediate relief of pain or discomfort from CAD symptoms (Frankl, 1990). Nonetheless, restenosis of the dilated vessel after PTCA continues to undermine the initial potential success, compromising the long-term benefits, and to diminish the potential cost effectiveness of this technique for some patients. Restenosis occurs in 13 to 47% of the patients' dilated vessels who have previously undergone PTCA (Ben-Ari, Rothbaum & Linnemeir, 1989; Bliley & Ferraw, 1993; Althaus, 1995).

Because patients treated with PTCA do not experience the pain and loss of time away from work, as compared to patients treated with CABG, they may not view the event as serious and, therefore, may be less motivated to change their behavior toward risk factors for CAD (Gaw, 1992). Although it has been suggested that the experience of undergoing a myocardial revascularization procedure should provide patients with the impetus to implement necessary lifestyle changes to alter their CAD risk factors, assessment of the intentions of post-PTCA patients' to modify CAD reduction risk behaviors has not been widely investigated (Gaw, 1992). It is therefore important to address this area of investigation in order to reduce the probability of increased CAD complications. Risk factors, such as smoking, have been associated with restenosis of lesions previously treated by PTCA (Ries, Kurtz, Silverman, & Pasternack, 1991; Rothlisberger & Meier, 1995).

Reinforcement of patient instructions from physicians by acute care nurses or other allied health professionals could effectively help patients recognize the importance of the recommended changes or modifications and could promote specific cardiac rehabilitation behaviors (Gaw, 1992). A variety of factors may influence a patient's compliance to

instructions from a health care provider. First, with regard to the patient, factors that may influence their compliance to behavior change may include knowledge of CAD risk factors, knowledge and skills of risk reduction behaviors, support from family, extended family and friends, willingness and readiness to change behavior, perception of personal risk for CAD, perception of control over risk factors, and convenient access to CAD risk-reduction modalities.

With regard to health care providers, factors that may influence a patient's compliance to long-term behavior change may include training in health communication, referral source for risk-reduction therapy, willingness to use referrals, knowledge and skills in providing patient education, value placed on patient education, time available for patient education, follow-up reinforcement of patient education, financial incentives received for patient education, and managed care pressures.

Given the economic burden associated with CAD and the need to contain health care costs, it is important to understand patients' intentions to change behaviors to reduce the impact of their CAD risk factors on their disease and possibly prevent restenosis. The theory of planned behavior (TPB) was used to identify the intentions of patients to reduce CAD-related risk behaviors after PTCA. This theory is similar to the theory of reasoned action (TRA) but includes a third determinant of intention described as perceived behavioral control (Ajzen, 1985). Theoretical issues will be discussed in the following chapter.

Purpose of the Study

The purpose of this study was to assess the intentions of post-PTCA patients to modify the risk behaviors associated with CAD progression. The specific risk behaviors

examined in the study included smoking, high fat dietary intake, and lack of physical activity.

Research Questions

The following research questions directed the study:

1. Will patients reveal intentions to quit smoking after PTCA?
2. Will patients develop plans to quit smoking after PTCA?
3. Will patients exhibit different smoking patterns before and after PTCA?
4. Will patients reveal intentions to develop different activity patterns before and after PTCA?
5. Will patients formulate plans to establish different activity patterns before and after PTCA?
6. Will patients show different activity patterns before and after PTCA?
7. Will patients reveal intentions to modify their diet after PTCA?
8. Will patients develop plans to modify their diet after PTCA?
9. Will patients show different diet patterns pre and after PTCA?
10. Are there any gender differences in the intentions to stop smoking, engage in physical activity, or modify diet among post-PTCA patients?
11. Does a patient's perception of his or her health status significantly change before PTCA compared to after PTCA?

Limitations of the Study

The following are limitations of this study:

1. The sample size was small and fewer smokers were included in the study, thus limiting the inferences about the general population.

2. The patient's knowledge level and understanding of the diagnosis, as well as methods of risk reduction and degree of disease advancement, prevent the inference of the causality of the CAD.

3. The sample was one of convenience and limited to southern states. Thus, generalization beyond this sample was limited.

4. The results were based on data self-reported by patients, with no corroborative objective information; recall bias and possibly misleading information were provided to satisfy their physicians.

Definition of Terms

The following terms are used in the study:

Angioplasty: Altering the structure of a vessel, either by a surgical procedure or by dilating the vessel using a balloon inside the lumen.

Atheroma: Fatty degeneration or thickening of the walls of the arterial structures occurring in atherosclerosis.

Cardiologist: A physician specializing in treatment of heart disease.

Coronary artery bypass grafting surgery (CABG): A shunt, established surgically, that permits blood to travel from the aorta to a branch of the coronary artery at a point past an obstruction.

Coronary artery disease (CAD): Narrowing of the coronary arteries to a degree by that prevents adequate blood supply to the myocardium. The narrowing is usually caused by atherosclerosis, and it may progress to the point where the heart muscle is damaged due to lack of blood supply.

Coronary heart disease (CHD): Decreased flow of blood to the heart muscle to the extent that either basic needs for oxygen are unmet or oxygen supply is insufficient when an increased demand for oxygen is made, as in work. The cause is usually due to atherosclerosis of the coronary arteries though other factors may limit the flow of blood through these vessels.

Double-lumen catheter: A central catheter containing two separate channels or passage ways.

Percutaneous transluminal coronary angioplasty (PTCA): A method of treating localized coronary artery narrowing. A special double-lumen catheter is designed so that a cylindrical balloon surrounds a portion of it. Inflation of the balloon with pressure approximately 10 psi dilates the narrowed vessel.

Restenosis: The recurrence of a stenosis condition as in a heart valve or vessel.

Theory of planned behavior (TPB): Suggests that performance of a behavior results from a person's reasoned intention to perform or refrain from performing a behavior (Ajzen, 1985).

Theory of reasoned action (TRA): Proposes that a person's intention to perform a specific behavior can be predicted from the person's general attitude toward that behavior and their perceived subjective norm, which is based on the beliefs of what significant others think they should do (Ajzen & Fishbein, 1970).

Volitional control: That which a person can decide to perform or refrain from.

CHAPTER 2

REVIEW OF LITERATURE

This chapter will discuss coronary artery disease (CAD), risk factors for developing CAD, and commonly used therapeutic procedures for diagnosing and treating patients with advanced CAD. In addition, this chapter will discuss restenosis, factors associated with restenosis, and avenues for reducing the potential for this problem. The theoretical framework, the theory of planned behavior (TPB), that guided this study will also be discussed.

Web of Causation

Atheroma is the earliest lesion in atherosclerotic CAD. During the atherosclerotic process, fatty materials accumulate beneath the intima, which is the inside lining of the artery wall. The fatty deposit causes the intima to project into the artery. The atheroma may become calcified, rupture, and cause roughening of the intima. Fibrin and platelets will start accumulating, leading to formation of fibrin clots. As the lipid accumulates, plaque rupture and subintimal hemorrhage are repeated, and the coronary artery becomes narrower. Blood flow is restricted, which deprives the myocardium of an adequate blood supply. This atherosclerotic plaque formation is the main cause of CAD in over 90% of patients (Markakis, 1990). The major controllable risk factors related to CAD include smoking, hypertension, hypercholesterolemia, diabetes, and physical inactivity. Other risk factors that can be controlled include body weight and stress. Risk factors that cannot be

controlled include age, sex, family history, prior myocardial infarction (MI) and co morbidities (Ries, Kurtz, Silverman, & Pasternack, 1991).

Recurrence (restenosis) after percutaneous transluminal coronary angioplasty (PTCA) is a major concern and has somewhat limited the long-term success of the procedure. Several studies relate recurrence to clinical, morphologic, technical (or procedural), and pharmalogic reasons (Holms et al., 1984; Mata et al., 1985; Leimgruber et al., 1986; Myler, Shaw & Stertz, 1987; Califf et al., 1990). Clinical factors are defined as historical, or systemic, processes. Examples include a history of diabetes, smoking, hypercholesterolemia, and anginal patterns. Morphologic factors are defined as characteristics which describe the severity, location, length, or composition of a specific atheroma. Examples include percent size of diameter stenosis, trans-stenotic pressure gradient, lesion length and eccentricity, and the presence of calcification. Technical factors are defined as procedure-related aspects involved in the performance of angioplasty. Examples of these include dilation balloon size and balloon inflation pressure. Pharmacological factors reflect various medications given to angioplasty patients associated with and following the procedure, including aspirin and calcium channel blockers.

Restenosis usually occurs within the first 6 months following the original PTCA. (Stone, Grines, & Browne, 1995; Veen, de Boer, & Zijlstra, 1995; Michels & Yusuf, 1995). Most patients who develop restenosis have symptomatic deterioration, such as anginal pain. Asymptomatic restenosis occurs in approximately 10% of patients. Beyond 6 months, symptom deterioration progression is related predominantly to other lesions remote from the site of angioplasty (Popma & Gregory, 1989; Ohtani & Hiasa, 1995).

Percutaneous Transluminal Coronary Angioplasty (PTCA)

Since 1977, there has been a tremendous expansion in the PTCA patient population. According to the National Heart, Lung, and Blood Institute (NHLBI), approximately 41,000 PTCA's were performed nationwide in 1981. By 1988, this number had skyrocketed to approximately 500,000 PTCA's (Fields & Thompson, 1991), and in 1993 approximately 793,000 cases of PTCA were documented (Graves, 1993). PTCA is widely accepted as a viable and often preferred alternative treatment to CABG. A recent clinical trial comparing primary PTCA with thrombolytic therapy concluded that PTCA provides a small to moderate short-term clinical advantage over thrombolytic therapy (Ellis, Phillips, & Betrin, 1997). Also, this trial recommended that, if primary PTCA can be accomplished promptly at experienced centers, the procedure should be considered an excellent alternative method for acute myocardial infarction (AMI). Approximately 2,000 PTCA's were conducted during 1995 at The University of Alabama at Birmingham (UAB) Hospital, Birmingham, Alabama.

Current Indications for PTCA

Until 1977, drug therapy and CABG were the only treatment options available for patients with symptomatic CAD. Since then, PTCA has evolved as the often preferred therapeutic option. PTCA uses a balloon-tipped catheter to dilate stenosed coronary arteries, thereby increasing blood flow to the myocardium. The current indications for PTCA, as described in a Report of the Joint International Society and Federation of Cardiology and the World Health Organization Task Force on Coronary Angioplasty (Bourassa, 1988), were classified into three groups. Patients in the first two classes have

indications for PTCA, while patients belonging to Class 3 have relative contra-indications and generally should not undergo PTCA.

Class I: Accepted indications suitable for PTCA. Chronic stable angina unresponsive to medical therapy or unstable angina: (a) Objective evidence of myocardial ischemia, (b) good left ventricular function (ejection fraction >35%), and (c) single significant coronary stenosis.

Class II: Evolving indications suitable for PTCA. (a) Chronic stable angina or unstable angina in patients with multivessel disease, (b) angina in patients with recent coronary occlusion (less than 3 months), (c) no angina or mild angina following medical therapy with a strongly positive exercise test, (d) documented variant angina with significant fixed lesions, (e) AMI, (f) angina after CABG, (g) angina in inoperable or high-risk patients, and (h) angina in elderly patients (>75 years).

Class III: Relative contraindications. (a) No angina or mild angina without evidence of myocardial ischemia, (b) severe left ventricular dysfunction (ejection fraction <25%), (c) significant left main coronary artery stenosis, and (d) patients in whom the only lesions are chronic coronary occlusions (older than 3 months).

Patients with severe hypertension, advanced age, or symptomatic cerebrovascular disease should also be treated with PTCA, if available, to lower the risk of intracranial hemorrhage (Gore, Granger, & Simoos, 1995).

Procedural Description

PTCA is performed in the cardiac cathetrization laboratory under local anesthesia. The procedure usually takes less than 2 hr. It can be performed through the femoral or brachial route. A balloon-tipped catheter is advanced across the lesion in a segment of the

stenosed coronary artery. Once the catheter is positioned over the lesion, it is filled with contrast medium to adjustable balloon pressure of 1 to approximately 10 atmospheres. The filling phase of the balloon can last up to 60 sec. Inflating the balloon exerts a force perpendicular to the long axis of the artery, this force is thought to crack the lesion and compact the contents of the atheroma inside the wall of the vessel. PTCA fails in about 10% of cases, and, if dilation is not successful, early elective CABG is recommended (Markakis, 1990). Throughout the procedure the patient, is medicated with heparin to prevent clot formation, and intracoronary nitroglycerin is administered in small doses to improve blood flow in the distal vessels and to decrease the chance of coronary spasm (Slemons, Beeon, & Oteham, 1991).

Prognosis

According to the National heart, lung, and blood institute (NHLBI) Angioplasty Registry, a technically successful dilatation is defined as a reduction by at least 20% of the narrowing of the stenosed vessel's diameter. A clinical success is defined as successful dilatation of all lesions in which angioplasty was attempted, without the occurrence of in-hospital death or AMI, or the need for CABG (Popma & Gregory, 1989). Recent reported rates for the success of primary PTCA in the community range from 46 to 94% (Jhangiani, Jorgensen, & Mansukhahani, 1996; Neuhaus, Vogt, & Hamjanz, 1996).

Behavioral Perspective

A behavior may be said to be completely under a person's control if the person can decide to perform it or not to perform it. Conversely, the more that performance of the behavior is contingent on the presence of appropriate opportunities or on possession of

adequate resources (time, money, skills, cooperation of other people, etc.), the less the behavior is under volitional control (Ajzen & Madden, 1986).

Several studies have shown that PTCA not only reduces the length of hospital stays and the cost of cardiac illness, but also claims comparative immediate success with CABG for revascularization of occluded coronary arteries (Gray, Hampton, & Bernstein, 1990; Hlatky, Lipscomb, & Nelson, 1990; Althaus, 1995). Because failure of the procedure could leave the patient facing CABG, patient anxiety may be high before, during, and after PTCA (Markakis, 1990). The same attractive aspects of PTCA, however, may decrease the patient's motivation to change life-style and health behaviors known to reduce CAD risk factors related to the patient's cardiac health (Gaw, 1992).

Techniques Related To Patient Care After PTCA

The majority of studies on PTCA focus on procedural and post-procedural techniques related to patient care. Few, if any studies, address health providers' efforts in patient education to reduce the patients' subsequent risk for CAD progression as well as enhance their recovery from PTCA (Barbiere, 1990, 1991). Few studies on PTCA interventions recommended the need for continued education by health care providers designed to modify life-long risk behaviors and enhance knowledge on CAD risk factors. Murphy, Fishman, & Shaw, (1989) reported that knowledge of cardiac risk factors and modifications of risk factors that were recommended were not recalled by patients within 6 months of the cardiac procedure.

Caring for a patient undergoing a PTCA means meeting the patient's physical, mental, emotional, social, and educational needs. This involves providing patient care not only from a biomedical, but also from a biopsychosocial perspective. The uncertainty of PTCA

success, the possible need for CABG, and the inherent risks contribute to the anxiety and emotional stress of PTCA patients. Adequate educational preparation can significantly ease the fears of both the patient and family (Gaw, 1992). While continuing education can foster life-long behavioral revisions in patients, family members' knowledge of the importance of life-style changes can promote increased motivation to change behaviors. This may help the patient recover from PTCA and adjust to life-style modifications. In addition, the family's understanding of the PTCA procedure and the patient's current cardiac health can help the patient understand that the ease and simplicity of the PTCA does not indicate a cure from heart disease (Markakis, 1990).

Patients' Motivation

Many of the leading causes of death, disease, and disability, including CAD, are directly related to individual behaviors, such as smoking, eating high-fat foods, and not exercising (Fries et al., 1993). Patients who have received a PTCA procedure may not consider themselves severely ill or disabled by their disease. After angioplasty, many subjects may think they are cured or "normal" and may not make the necessary life-style changes to prevent recurrence of CAD (Gaw, 1992). Other factors may be associated with lack of behavior change, including the brief hospitalization period associated with PTCA and the inadequate time available for health care providers providing information related to CAD risk reductions and assessing the patients' knowledge, skills, and resources to successfully modify their behavior. As such, patients who are recommended for PTCA should be targeted for educational interventions designed to reduce their future risk for restenosis and other CAD progression.

A first step in promoting life-style changes in PTCA patients is assessing their knowledge of heart disease, including risk factors, risk reduction techniques, and therapeutic modalities. Risks should be categorized into those that can be modified by the patient and those that cannot be modified. The relative ease of the PTCA procedure may reduce patients' fears and thus decrease their motivation to reduce known CAD risk factors after the procedure. The concept of motivation has been extensively discussed in cardiac rehabilitation literature and has been defined as individual intention and actions toward initiating life-style changes (Gaw, 1992). Fleury (1991) described health promoting behaviors as individual choices meeting certain needs or changing unhealthy behaviors. A unique educational opportunity exists in the early period after PTCA. Patient motivation is important when attempting to modify behavior, and motivation will seldom be greater than the period after successful PTCA. The clinician, therefore, should use this opportunity to promote risk-factors modification behaviors and resources available in guiding behavior changes.

Theoretical Overview

The theory of planned behavior (TPB) suggests that performance of a behavior results from a person's reasoned intention to perform or not perform a behavior (Ajzen, 1985). This theory is similar to the theory of reasoned action except it adds a third determinant of intention, perceived behavioral control. The theory of reasoned action (TRA) (Ajzen & Fishbein, 1970; Ajzen, 1988) was designed to predict the performance of volitional behaviors (the conscious decision to perform or not perform, a specific behavior). The TPB proposes that a person's intention to perform a specific behavior can be predicted from (a) the person's general attitude toward that behavior, (b) the perceived subjective

norm, which is based on the beliefs of what significant others think should be done, and (c) the perceived behavioral control. This intention to perform the behavior will predict the subsequent behavioral act (Ajzen, 1985) (See Figure 1).

The TPB adds perceived behavioral control as a third predictor of intentions, independent from attitudes and subjective norms. Perceived behavioral control is similar to self-efficacy. Self-efficacy beliefs can influence choice of activities, preparation for an activity, effort expended during performance, as well as thought patterns and emotional reactions (Bandura, 1991). The TPB places the construct of self-efficacy belief or perceived behavioral control within a more general framework of the relations among beliefs, attitudes, intentions, and behavior (Ajzen, 1991). Factors considered in this determinant include barriers, resources and opportunities. As in the TRA, a central factor in the TPB is the individual's *intention* to perform a behavior. Intentions are assumed to capture the motivational factors that impact behavior and are indications of how hard a person is willing to try, and of how much of an effort is planned to perform a specific behavior (Pratkanis, Breckler, & Greenwald, 1989). The TPB postulates three conceptually independent determinants of intentions. The first is the *attitude* toward the behavior. This postulate refers to the degree to which the person has a favorable or unfavorable evaluation of the behavior in question. The second predictor is a social factor termed *subjective norm*; it refers to the perceived social pressure to perform or not perform the behavior. The third and novel antecedent of intention is the degree of *perceived behavioral control*. This factor refers to the perceived ease or difficulty of performing the behavior, and it is assumed to reflect past experience as well as anticipated impediments and obstacles (Pratkanis et al., 1989).

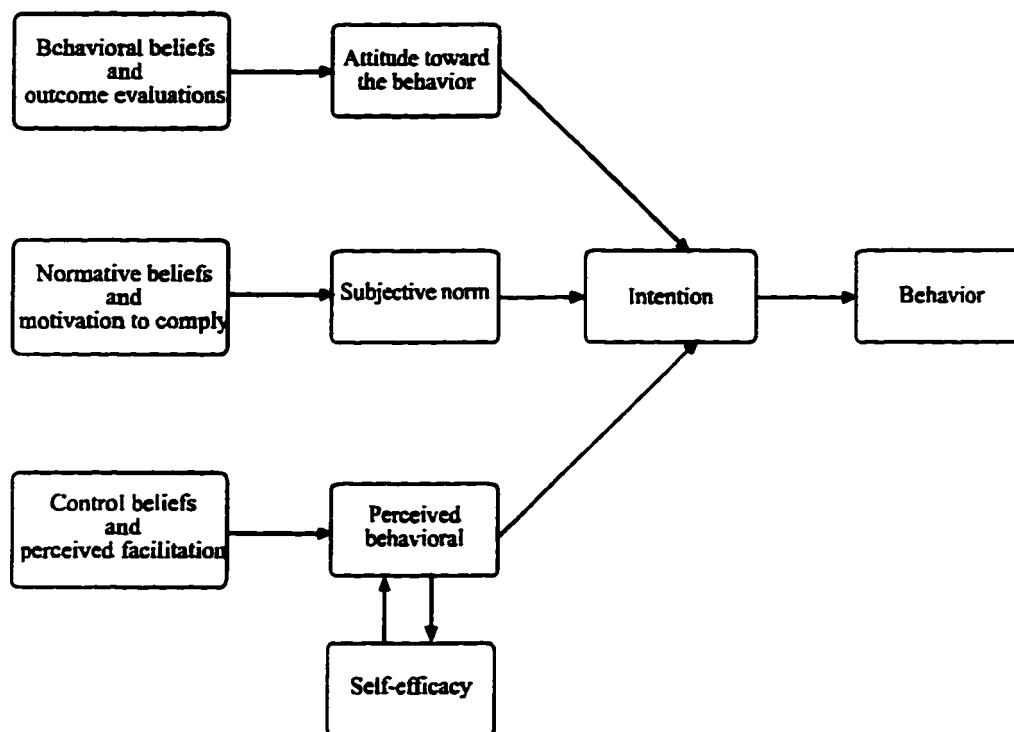


Figure 1. Theory of planned behavior.
Adapted from (Pratkanis et al., 1989).

The TRA and TPB have received considerable empirical support as means of predicting and explaining a variety of health-related behaviors. Murphy and Brubaker (1990) and Brubaker and Wickersham (1990) found performance of testicular self-examination by college students over a 6 week period related significantly to attitudes toward the behavior, subjective norm, and perceived control and that those who performed the exam differed significantly from those who did not perform in terms of outcome and normative beliefs.

Although some researchers comparing the predictive powers of the TRA and have concluded that the TRA performed just as well as the TPB (Fishbein & Stasson, 1990; Hinsz & Nelson, 1990), most comparisons of the two models have found a predictive advantage for the TPB (Beck & Ajzen, 1991; Brubaker & Fowler, 1991; Madden, Ellen, & Ajzen, 1992; Schlegel, d'Avemas, Zanna, DeCourville, & Manske, 1992). The TRA is applicable when the behavior in question is under volitional control. However, when the behaviors violate the assumption of volitional control, the TPB is superior to the TRA for the prediction of target behavior. In addition, the TPB may explain more variation in behavioral intentions than the TRA regardless of the volitional control (Madden et al., 1992).

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to provide an overview of the methodology used in this study. Topics addressed in this chapter include the selection of study participants; the Institutional Review Board (IRB) process; the design, construction, and pilot of the survey of the instrument; and an overview of data analysis.

Research Questions

The following research questions directed the study:

1. Will patients reveal intentions to quit smoking after PTCA?
2. Will patients develop plans to quit smoking after PTCA?
3. Will patients exhibit different smoking patterns before and after PTCA?
4. Will patients reveal intentions to develop different activity patterns before and after PTCA?
5. Will patients formulate plans to establish different activity patterns before and after PTCA?
6. Will patients show different activity patterns before and after PTCA?
7. Will patients reveal intentions to modify their diet after PTCA?
8. Will patients develop plans to modify their diet after PTCA?
9. Will patients show different diet patterns before and after PTCA?

10. Are there any gender differences in the intentions to stop smoking, engagement in physical activity, or diet modification among post-PTCA patients?

11. Does a patient's perception of his or her health status significantly change after PTCA compared to before PTCA ?

Setting, Population, and Sample

In order to assess factors related to restenosis in patients diagnosed with advanced CAD and recommended for PTCA, the TPB was applied to a sample population consisting of voluntary, self-selected patients admitted to the University of Alabama at Birmingham (UAB) hospital for PTCA. A list of admissions for PTCA was provided to the investigator through the clinical cardiology advisor's office. While preparing patients for the PTCA procedure in the same-day surgery unit, the cardiology staff described the purpose of the study to the potential candidates and requested permission for an interview by the investigator. If the patient agreed to the interview, an informed consent was obtained and the patient became a study participant.

Approval of a plan to protect human subjects was obtained from the Institutional Review Board for Human Use at the University of Alabama at Birmingham (Appendix A). Approval to conduct the study at the University Hospital was obtained from the director of the Interventional Cardiology.

Participants selected for this study were patients that had an initial diagnoses of CAD and required PTCA. Subjects were given an informed consent form and completed a one-page demographic information including smoking, diet, and exercise history. The demographic data were detached and coded numerically to correlate with the questionnaire. The demographic data were kept in a separate file. The pre-PTCA

questionnaire was administered immediately prior to the PTCA procedure while the post-PTCA questionnaire was administered approximately 6 weeks after the surgical intervention. The 6 week follow-up period was selected because most subjects have returned to normal activities within this time and are scheduled to visit their physician for a follow-up visit at that time. Seventy patients who were admitted to UAB hospital for the initial PTCA were interviewed. Data on 68 subjects were available for analysis.

Instrumentation

A literature review was conducted to (a) assess the status of PTCA therapy, (b) assess information on facts related to restenosis, (c) identify methods for reducing the need to repeat PTCA, and (d) assess the use of the TPB in clinical settings. Based on the literature review, a pre- and postsurvey instrument was developed by the investigator by selecting previously used scales and adding investigator-developed questions drawn from an application of the TPB in the study population. The instrument was assessed for content validity by a group of experts consisting of cardiologists, nurses, and health educators. The instrument was piloted for use in the same-day surgery unit at UAB Hospital.

The following steps were used in the development of the instrument:

1. Questionnaire formation was based on the TPB constructs, which include attitude toward the behavior (behavioral beliefs and outcome evaluation), subjective norm (normative beliefs and motivation to comply), and perceived behavioral control (control beliefs and perceived facilitation). A five-point of Likert scale was used (1 [strongly disagree], 2 [disagree], 3 [uncertain], 4 [agree], 5 [strongly agree]). Input was received

from the members of the dissertation committee and other content experts identified by the investigator.

2. A group of practicing experts in epidemiology, medicine, nursing, health education, health behavior, and education research critiqued the instrument, reviewed questions for clarity, and gave suggestions for improvement to enhance content validity.

3. The instrument was pilot tested on a sample of 5 patients that included one African American male, one African American female, two White males, and one White female between the ages of 42 and 80 years-old who were admitted to the same-day surgery unit at UAB Hospital for PTCA. The content was modified based on the feedback from patients and time required to complete the questionnaire. An average of 15 minutes was required for a patient to complete the questionnaire.

4. A statistician was consulted after the completion of the pilot testing, and final revisions were made to enhance internal consistency measures for the scales.

A research-based self-administered questionnaire, Risk Reduction Behaviors Assessment consisting of 14 demographic questions, 52 pre-PTCA, and 52 post-PTCA questions (Appendix B) was finalized upon completion of the instrument development process. The following description includes the sections and contents of the questions that were used for this study.

Demographics. Thirteen questions were used to obtain information on respondents. These questions included items designed to elicit age, gender, ethnicity, height and weight, primary and secondary diagnosis, history of cardiac problems and CVD in the family, smoking, diet, and exercise history.

Intention to quit smoking behavior. Fourteen questions related to patients' intention to quit smoking after the PTCA procedure.

Intention to follow an exercise program behavior. Fifteen questions related to patients' intention to follow an exercise program after the PTCA procedure.

Intention to modify the diet behavior. Fifteen questions related to patients' intentions to modify their diet after the PTCA procedure.

The role of others. Six questions were asked in a format of least and most influencing patient's behaviors changes related to his or her health.

Health status perception. One question related to the patient's perception of his or her health status, very unhealthy, average or extremely healthy. The survey in its entirety is included in Appendix B.

Data Collection

The patients were given the consent forms (Appendix C) to read and sign after they agreed to be part of the study. The letter of informed consent contained a brief overview of the study. Both the patient and the investigator kept a copy. The section of the questionnaire related to demographic data was detached from the rest of the pre-PTCA questionnaire and was kept in a separate file. At the conclusion of filling the pre-PTCA questionnaire, the patient was advised that he or she would receive a similar questionnaire and self-addressed envelope to be completed six weeks after the PTCA procedure (Appendix D).

Six weeks after the PTCA, questionnaires were mailed to the subjects for completion. In order to assure a prompt response from patients, at the end of 2 weeks of mailing the

post-PTCA questionnaire, a follow-up phone interview, if needed, was administered by the investigator for those patients that had not returned their response.

Data Analysis

Using the software package SPSS, the data were coded, sorted, and compared. Initial descriptive statistics were calculated from the demographic data provided by the participants. The total number of participants, including the percentage across gender and race, was computed and reported. The mean age, mean weight, and the mean height, including the standard deviation, were computed. The primary and secondary diagnosis, previous cardiac problems, history of CAD in the family were obtained, and the percentage were computed. Table 1 provides the methodology used to answer the research questions posed in this study.

Table 1

Methodology Applied to Answer the Research Questions

Research questions	Data source
1	Percentage of patients who revealed their intentions to quit smoking was computed.
2	Percentage of the smokers who were planning to quit smoking was computed.
3	Percentage of patients who actually quit or reduced smoking after PTCA was computed.
4	Percentage of patients who revealed their intentions to develop physical activity after PTCA was computed.
5	Percentage of patients who were planning to establish a regular physical activity was computed.
6	Percentage of patients who did report a change in their activity after PTCA was computed.
7	Percentage of patients who revealed intentions to modify their diet after PTCA was computed.
8	Percentage of patients who developed plans to modify their diet was computed.
9	Percentage of patients who reported a change in their diet consumption after PTCA was computed.
10	Mean score differences between males and females for smoking, physical activity, and diet modification using independent groups t test
11	Percentages of patients' responses to their perception of their health status before and after PTCA were computed and compared

CHAPTER 4

RESULTS

The purpose of this study was to assess the intentions of post-PTCA patients to modify the risk behaviors associated with CAD progression. The specific risk behaviors examined in the study included smoking, dietary intake, and physical activity. This chapter will report the findings obtained from this investigation which utilized a 52-item pre- and post-PTCA survey administered to patients recommended for a PTCA therapy for the first time at the University of Alabama at Birmingham (UAB). Data collected were of a self-reported nature. Results obtained from this clinical investigation were reported separately to answer the research questions.

Subjects and Review of Methodology

In order to address the purpose of the study, a sample of 70 patients with an initial diagnosis of CAD for which PTCA therapy was recommended was asked to participate in the study. A list of admissions for PTCA was provided to the investigator through the clinical cardiology advisor's office. While preparing patients for the PTCA procedure in the same-day surgery unit, the cardiology staff described the study to the potential candidate and requested permission for the investigator to interview the patient. If the patient agreed to participate in the study, an informed consent was obtained, and the patient was interviewed by the investigator. A total of 70 patients who were admitted

UAB hospital for PTCA for the first time between November 1996 and February 1997 were subsequently interviewed by the researcher.

A 52-item pre-PTCA questionnaire was administered to the participants via interview. The pre-PTCA survey included 11 demographic items. These items were completed on the day of admission before patients went to the catheterization laboratory for the PTCA. Sixty-eight patients returned the 52 post-PTCA questions 6 weeks after they were discharged from the hospital after the PTCA procedure. Two of the patients were eliminated from the final analysis. One patient was eliminated because a PTCA was not performed, and the other was omitted because of in-hospital death following the procedure. This reduced the total sample size for follow-up to 68 patients.

Characteristics of the Sample Population

Demographic characteristics of the interviewed patients who met the eligibility criteria for this clinical study are summarized in Table 2. A total of 36 males (28 Whites and 8 African Americans) and 32 females (28 Whites and 4 African Americans) were included in this study. Participants age range was 41 to 86, with a mean age of 60.

Table 2

Patient Demographics with CAD Diagnosis

Demographics (<u>N</u> = 68)	<u>M</u> Age (year)	<u>SD</u>	<u>M</u> Height (inch)	<u>SD</u>	<u>M</u> Height (lb)	<u>SD</u>
Males						
Whites <u>n</u> = 28	60.10	9.90	70.30	2.50	198.00	37.00
African Americans <u>n</u> =8	60.70	8.80	67.00	2.20	181.80	22.60
Females						
Whites <u>n</u> = 28	64.60	10.90	64.50	3.10	155.00	36.10
African Americans <u>n</u> = 4	57.80	8.30	65.00	3.60	190.30	40.00

As noted in Table 2, the mean age of the respondents in this study was 60. The height ranged for these patients was between 65 to 70 inches. While the mean weight of White males was 198 pounds and White females was 155 pounds, the mean weight of African American males was 181 pounds and the African American females was 190 pounds.

African American males reported familial history of CAD more often than their White male counterpart. In contrast, however, African American females reported the lowest known previous familial history of CAD when compared with White females. In fact, African American females reported familial and individual history of CAD less frequently than any other segment in this study population (Table 3).

Table 3

Percentage Distribution of Respondents Reporting History of CAD

Demographics (N = 68)	Self	Family	Father	Mother	Brother	Sister
Males						
Whites	12.5	37.5	17.9	23.2	14.3	5.4
African Americans	25.0	33.3	16.7	25.0	16.7	8.3
Females						
Whites	19.6	42.9	21.9	19.6	14.3	8.9
African Americans	8.3	25.0	25.0	16.7	8.3	0.0

As noted in Table 4, more White males were identified smoking as a common behavior before PTCA more than their African American males counterpart. All African American males quit smoking after PTCA. All the respondents were consuming a low-fat diet after PTCA.

As noted in Table 5, Hypertension was reported more frequently among African Americans than Whites. African American males reported more utilization of the health

care system for physical check up, though, in contrast, African American females reported less utilization of the health care system for physical check up.

Table 4

Percentage Distribution of Respondents Reporting CAD Risk Factors Before and After PTCA

Demographics (N = 68)	CAD factors					
	<u>Smoking (%)</u>		<u>Physical activity(%)</u>		<u>High fat diet (%)</u>	
	<u>Before</u>	<u>After</u>	<u>Before</u>	<u>After</u>	<u>Before</u>	<u>After</u>
Males						
White	14.3	7.1	21.4	37.5	3.6	0.0
African American	8.3	0.0	41.7	50.0	25.0	0.0
Females						
White	10.7	3.6	33.9	37.5	3.6	0.0
African American	8.3	8.3	16.7	25.0	0.0	0.0

Note. CAD = Coronary Artery Disease

Table 5

Percentage Distribution of Respondents Reporting Secondary Diagnosis to CAD and Annual Physical Check.

CAD factors	<u>Male</u>		<u>Female</u>	
	Whites	African Am.	Whites	African Am.
Hypertension (%)	22.6	40	22.6	40
Annual physical check (%)	37.5	50	46.4	33.3

Note. N = 68

Results of the Research Questions

The following section presents results obtained from this investigation on a question-by-question format. The research questions posed in chapter 1 was addressed, followed by

results relevant to each question. Eleven research questions were proposed for this investigation.

Research Question 1: Will patients reveal intentions to quit smoking post PTCA? A total of 16 patients, 24% of the total sample, were smokers (11 males and 5 females). When they were asked about their intentions to quit smoking after PTCA, approximately 13% were uncertain whether they would quit smoking, 31% revealed a desire to quit smoking, and the remaining 56% indicated a strong desire to cease smoking.

Research Question 2: Will patients develop plans to quit smoking after PTCA? Half of the smoking population (8 of 16), 50%, indicated they intended to quit smoking without substituting something else for tobacco. Interestingly, 56% of the smoking population did not include participation in educational classes designed to promote smoking cessation in their plan to quit smoking. When the smoking population was asked whether it might be easy for them to quit smoking, approximately 50% felt that it would be, while approximately 13% noted that modifying this behavior may be difficult. The other 37% were uncertain. An overwhelming 88% of the respondents felt it was wise for them to quit smoking.

Research Question 3: Will patients exhibit different smoking patterns before and after PTCA? Out of the 16 smokers, 9 patients (6 males and 3 females), or 56% of this group, reported quitting smoking after PTCA. The remaining 7 smokers (5 males and 2 females) reported reducing their cigarette utilization by half the amount they were smoking before the procedure.

Research Question 4: Will patients reveal intentions to develop different activity patterns before and after PTCA? Of the 68 patients that were asked about their intentions

to develop an exercise program after PTCA, approximately 84% revealed strong to very strong intentions to adopt an exercise program after PTCA. The remaining 16% were either uncertain regarding their intentions to incorporate exercise into their lifestyle or felt they would not engage in this risk-reduction method.

Research Question 5: Will patients formulate plans to establish different activity patterns after PTCA? A total of 52 patients responded to this question. The other 16 patients were not included in the analysis of this research question because they did not adopt an exercise program after PTCA. When they were asked if they would have to exercise on a regular basis after PTCA, approximately 92% felt that a plan to promote physical activity was necessary in order for them to achieve this task. Approximately 85% included in their plans spending less time watching television in order to be able to exercise more. In addition, about 60% felt it would be easy for them to follow an exercise program, while 54% indicated that, in fact, it was wise for them to follow an exercise program. The group was divided over the need for structured educational classes to facilitate their transition from a sedentary to a more active life style. Approximately 50% planned to participate in educational classes, while approximately 39% did not include participation in such classes in their plan.

Research Question 6: Will patients show different activity patterns before and after PTCA? Postsurvey analysis revealed that 75% of this patient sample did report a change in their physical activity pattern after PTCA. For example, 68% reported exercising at least once a day and 27% twice a day. With regard to duration of activities, 17% reported exercising for at least 20 min, 23% at least for 30 min, and 23% for about 60 min per day. Walking was the most reported method of exercise for this post-PTCA procedure activity.

Research Question 7: Will patients reveal intentions to modify their diet after PTCA?

When the 68 subjects were asked about their intentions to modify their diet after the procedure, about 90% indicated that they did intend to modify their diet, while the remaining 10% did not intend to alter their diet because they reported that their diet was low in fat and that they felt no need to modify it.

Research Question 8: Will patients develop plans to modify their diet after PTCA?

Patients were asked six questions which examined their development of any plans to modify their diet after PTCA. Among those patients, 47% reported a plan to reduce their intake of starchy foods, while 56% indicated intentions to avoid restaurants in order to reduce their intake of risky foods or those associated with increased risk for CAD. This finding was interesting since Americans often enjoy dining out, even though dining out is often associated with an higher intake of fat calories. Approximately 70% of the patients were conscious about modifying their diet and planned to eat lighter meals. In fact, 63% of the group agreed that they should rely on and utilize a constant and healthy dietary regimen. Specifically, 97% of the respondents felt that it was wise for them to modify their diet to reduce their overall intake of fat. The remaining 3% felt their diets were already low in fat. When patients were asked whether it was easy to modify their diets, approximately 81% felt that it would be easy for them to engage in this behavior.

Research Question 9: Will patients show different diet patterns before and after PTCA? A significant drop in the number of patients who reported eating high fat diets were reported after PTCA. The 10% of this group of patients who were still eating high-fat diets prior to the procedure reported adding diets lower in fat post PTCA. Approximately 44% of the patients reported eating a moderate-fat diet before PTCA and

approximately 18% after PTCA. A significant increase in the number of patients who reported eating a low fat diet before PTCA with approximately 41% compared to approximately 80% after PTCA. A total of 28 patients (3 African American males, 2 African American females, 10 White males and 13 White females) were reported eating a low-fat diet before PTCA, and a total of 54 patients (7 African American males, 4 African American females, 21 White males and 22 Whites females) were reported eating a low fat-diet after PTCA.

Research Question 10. Are there any gender differences in the intentions to stop smoking, engagement in physical activity, or diet modification among post-PTCA patients? Differences in the intentions to modify the three behaviors assessed in this study, smoking, engagement in physical activity, and diet modification, were assessed and

Table 6

Mean Score Differences Between Males and Females for Smoking, Physical Activity, and Diet Modification

Behavior	Gender	<u>M</u>	<u>SD</u>	<u>t</u> score	<u>P</u>
Smoking	Males	4.33	0.87	-0.47	0.65
	Females	4.50	0.54		
Physical Activity	Males	4.00	0.81	-1.18	0.24
	Females	4.22	0.91		
Diet	Males	4.10	0.73	-1.72	0.09
	Females	4.38	0.66		

Note. N = 68

compared with regard to gender. No statistically significant differences were found between males and females on the intentions to quit smoking, engage in physical activity or modify diet after PTCA. Mean scores for the three behaviors are shown in Table 6. The mean scores for males and females were within the same range for three CAD risk-related behaviors assessed in this study: smoking, physical activity and diet modification.

Research Question 11: Does a patient's perception of his or her health status significantly change before PTCA compared to after PTCA? Patients were asked to rank their perception of their health status before and after PTCA. Choices available to the participants included 1 (very unhealthy), 2 (average), and 3 (extremely healthy). Among the 68 patients, 56 of them had the same response before and after PTCA. Hence, this group of patients predominantly identified their health status as average. Six percent of the respondents (2 White males and 2 White females) felt that their health deteriorated after the procedure, while the other 12% (5 White males and 3 White females) felt that their health improved after the procedure.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents an overview of the purpose, the research questions investigated, the sample population, methodology, instrumentation, and data analysis used in this study. Findings of the study are outlined, conclusions are presented, and recommendations for further studies are identified and discussed.

The purpose of this study was to assess the intentions of post-PTCA patients to modify the risk behaviors associated with CAD progression. The specific risk behaviors examined in the study included smoking, dietary intake, and physical activity.

PTCA therapy was selected for investigation because it often presents an attractive option and alternative to patients with severe CAD. Factors associated with the popularity of this therapy include (a) shorter hospital stay, (b) use of local anesthesia, (c) lower cost, and (d) potential immediate relief of pain or discomfort from CAD symptoms. Nonetheless, restenosis of the dilated vessel after PTCA continues to undermine the initial success, compromise the long-term benefits, and diminish the potential cost effectiveness of this technique. Both social and individual factors may be associated with the potential cost effectiveness of the PTCA therapy. For example, patients treated with PTCA may not view the event as serious and may, therefore, be less motivated to change their behavior to reduce further risk advancement of CAD. As such, recurrence or restenosis of the affected

artery after PTCA is a major concern and has somewhat limited the long-term success of the procedure.

Several studies relate restenosis to clinical, morphologic, technical, and pharmacologic causes. Although it has been suggested that the experience of undergoing a myocardial revascularization procedure should provide patients with the impetus to implement necessary life-style changes to alter their CAD risk factors, assessment of the intentions of post-PTCA patients' to modify CAD risk-reduction behaviors has not been widely investigated. It is therefore important to address this area of investigation in order to reduce the probability of increased CAD complications.

The sample population was composed of patients who were diagnosed with CAD and were recommended by their physicians for PTCA. Seventy patients who were admitted to the UAB Hospital for PTCA for the first time were interviewed, with usable data for analysis being collected on 68 subjects.

The survey instrument (a self-administered questionnaire) Risk Reduction Behaviors Assessment, consisted of 14 demographic questions, 52 pre-PTCA, and 52 post-PTCA questions. It was developed after careful review of the literature and consideration of scales proven valid and reliable with the study population. Content validity was assessed by a group of experts in the field, and the instrument was piloted with a similar population of patients who were admitted to the same-day surgery unit at UAB Hospital for PTCA.

Data were analyzed with SPSS software. Results obtained from the pre- and post-PTCA survey items were compared for differences by both descriptive and two-sample t tests. Assessment of the patients' perception of their health status before and after also

were compared, as were items on the role of others, which may have influenced the patients' decision to modify their behaviors to reduce future risk of restenosis.

Discussion

The mean age for the respondents in this study was approximately 60. These respondents were fairly representative of the region in regard to demographic characteristics. PTCA patients in this study ranged in age from 41 to 86 years of age. PTCA was recommended and performed for these patients. These findings, like those of Spaulding et al. (1997), reported that PTCA was most commonly performed on patients between the ages of 30 and 75.

Self-reported CAD risk factors in this study agreed with other studies which found hypertension a common comorbidity associated with CAD. The results reported in this study, along with results of previous studies (Cooper & Ford 1992; Keil et al., 1993), suggest that the prevalence of hypertension in African Americans was higher than those of Whites. African American males reported the association of hypertension with CAD more frequently than the other groups, while White females reported this morbidity less frequently. This finding is consistent with previous research (Dyer et al., 1990). Unlike findings of other studies (Raczynski et al., 1994; Crawford, McGraw, Smith, McKlinlay, & Pierson, 1994), more African American males than White males in this study reported having previous CAD symptoms.

The majority of smokers revealed their intentions to quit smoking after the PTCA procedure. More than half of the smokers actually quit smoking, and the rest reported a reduction of 50% in their cigarette use. None of the African American females quit smoking totally, but they did report reduction in their consumption pattern by half.

Previous research by Bjornson et al. (1995) found that it was more difficult for women than men to quit smoking. Most of the smokers indicated the importance of quitting smoking after PTCA in order to improve their health, but they did not perceive a need to substitute something else for tobacco.

Another interesting finding was that the majority of the smokers did not feel the need to participate in educational classes designed to promote smoking cessation in order to quit smoking. Research by Gilliss (1991) found that patients were eager to seek more information about risk-reduction behaviors related to CAD disease. Possible reasons for the patients in this study belief is that either they did not want to pay for such classes or they were trying to avoid any commitment to attend such classes.

The majority of the participants revealed intentions to get involved in more physical activities after PTCA. African American males reported the highest rates of participation in physical activity involvement before PTCA and remained the highest after PTCA. This finding is similar to previous research by Anderson et al. (1996). African American females were the lowest to report changing their activity patterns. This finding is consistent with Oldrige, Ragowski, & Gottlieb, (1992), where they found that women have been shown to have a lower rate of participation in cardiac rehabilitation programs and drop out of such programs at a higher rate than male counterparts. Again, less than half of the respondents did not feel the need to attend structured educational classes to facilitate their transition from the sedentary to a more active life-style.

The majority of patients indicated their intentions to modify their diet after PTCA; others felt that their diet was low in fat and decided to stay with the same regimen. Methods of modifying their diet included measures such as cutting out all starchy food,

avoiding restaurants, and eating lighter meals on a regular basis. African American males were among the highest in eating high-fat diets before PTCA, while African American females were the lowest in eating high-fat diets. None of the respondents reported eating high-fat diets after PTCA.

No statistically significant differences were found between males and females in their intentions to quit smoking, engage in physical activity, or modify their diets. However, it was noted that the mean scores of females were slightly higher than those of males in responding to the diet modification, suggesting that females use dieting more frequently than males. This finding is constant with previous research by (Nichter, Ritenbaugh, Vuckovic, & Aickin, 1995). This, however, may be simply a by-product of the American culture rather than a behavior which is used predominantly for a health benefit. Regardless of gender, dietary modifications should be stressed with all CAD patients in order to reduce risk of comorbidities or other cardiovascular diseases.

As previously noted, the majority of the participants perceived their health status as average before and after PTCA. However a few felt that their health deteriorated post PTCA, while others felt an improvement in their health.

According to the summary data, doctors were identified as the most influential group in promoting smoking cessation, while families were identified as the most influential group affecting engagement in and adherence to physical activity and diet modifications. The current study's findings support other research which suggests that patients find their doctors credible sources of smoking cessation advice (Slama, Redmans, Cockburn, Sanson, & Fisher, 1989). Friends were identified as the least influential group affecting a patient's smoking, physical activity, or diet patterns.

This study, like others, is not without limitations. The following limitations are noted in this study:

1. The sample size was small, and fewer smokers were included in the study, thus limiting the inferences about the general population.
2. The patient's knowledge level and understanding of the diagnosis, as well as methods of risk reduction and degree of disease advancement, prevent the inference of the causality of the CAD.
3. The sample was one of convenience and was limited to southern states. Thus, generalization beyond this sample is limited.

The results were based on data self-reported by patients, with no corroborative objective information; recall bias and possibly misleading information were provided to satisfy their physicians.

Conclusions

Based on statistical findings from this study, the following conclusions were drawn:

1. Hypertension is a commonly reported comorbidity associated with CAD; it is higher among African Americans.
2. African American males reported previous CAD symptoms more frequently than White males.
3. The majority of patients revealed their intentions to quit smoking, engage in physical activity, and modify their diet after PTCA.
4. Smokers indicated the importance of quitting smoking after PTCA in order to improve their health.

5. No significant differences between males and females were noted regarding their intentions to quit smoking, engage in physical activity, or modify their diet after PTCA.

6. Doctors are the most influential in promoting the need for smoking cessation, while families are more influential in promoting physical activity and diet modifications.

7. Patients did not feel the need to participate in educational classes designed to promote smoking cessation, physical activity engagement, or diet modifications.

Recommendations for Future Research

A number of recommendations for future research are particularly relevant. These include (a) replicate this study with a larger, diverse sample, including more smokers in order to determine generalizability of the results; (b) initiate a longitudinal study to investigate whether patients change their risk-reduction behaviors over the 6 months after PTCA; (c) examine individual recovery and motivation in CAD health behavior to provide a theoretical basis for the development of interventions that promote lasting health behavior changes, and enhance quality of life after PTCA; (d) initiate studies to examine the clinical validation of self reported data; (e) assess the psychosocial adjustment of women who have experienced a cardiac event; (f) utilize several hospitals; (g) extend the duration of the study; and (h) initiate a study that assesses these outcome variables among privately and publically insured patients to identify the intentions of behaviors modifications.

Recommendations for Practice

This study provides implications for clinical practice which may facilitate developing risk-reduction intervention programs. The following are a few recommendations:

1. Patients undergoing PTCA revealed intentions to modify risk behaviors related to their CAD. Therefore, risk-reduction educational programs should be designed in a framework as part of a cardiac rehabilitation program.
2. Patients' education should be based on prior assessment of their knowledge in relation to CAD risk factors and should occur prior to their admission, continue while at the hospital, and following discharge.
3. Since doctors are most influential in promoting smoking cessation, they should advise patients to quit smoking, instruct them about symptoms that signal restenosis, the need to report symptoms promptly, and the importance of life-long application of risk-reduction behaviors related to CAD.
4. Ongoing contact with support of a cardiac rehabilitation team could aid in maintaining initial intentions and enthusiasm as well as provide assistance with more difficult behaviors such as stress reduction.
5. Education should be individually tailored to both patients and families.
6. Clinical education efforts should be supported and reinforced by the community at large.

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APPENDIX A

UAB INSTITUTIONAL REVIEW BOARD FOR HUMAN USE APPROVAL



Office of the Institutional Review Board for Human Use

**FORM 4: IDENTIFICATION AND CERTIFICATION OF
RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS**

THE INSTITUTIONAL REVIEW BOARD (IRB) MUST COMPLETE THIS FORM FOR ALL APPLICATIONS FOR RESEARCH AND TRAINING GRANTS, PROGRAM PROJECT AND CENTER GRANTS, DEMONSTRATION GRANTS, FELLOWSHIPS, TRAINEESHIPS, AWARDS, AND OTHER PROPOSALS WHICH MIGHT INVOLVE THE USE OF HUMAN RESEARCH SUBJECTS INDEPENDENT OF SOURCE OF FUNDING.

THIS FORM DOES NOT APPLY TO APPLICATIONS FOR GRANTS LIMITED TO THE SUPPORT OF CONSTRUCTION, ALTERATIONS AND RENOVATIONS, OR RESEARCH RESOURCES.

PRINCIPAL INVESTIGATOR: Wajih A. Ahmad

PROJECT TITLE: An Assessment of Post-PTCA Patients' Intentions to Reduce Risk Behaviors Associated with Coronary Artery Disease (CAD)

1. THIS IS A TRAINING GRANT. EACH RESEARCH PROJECT INVOLVING HUMAN SUBJECTS PROPOSED BY TRAINEES MUST BE REVIEWED SEPARATELY BY THE INSTITUTIONAL REVIEW BOARD (IRB).
- X 2. THIS APPLICATION INCLUDES RESEARCH INVOLVING HUMAN SUBJECTS. THE IRB HAS REVIEWED AND APPROVED THIS APPLICATION ON 10-7-96 IN ACCORDANCE WITH UAB'S ASSURANCE APPROVED BY THE UNITED STATES PUBLIC HEALTH SERVICE. THE PROJECT WILL BE SUBJECT TO ANNUAL CONTINUING REVIEW AS PROVIDED IN THAT ASSURANCE.
- X THIS PROJECT RECEIVED EXPEDITED REVIEW.
- THIS PROJECT RECEIVED FULL BOARD REVIEW.
3. THIS APPLICATION MAY INCLUDE RESEARCH INVOLVING HUMAN SUBJECTS. REVIEW IS PENDING BY THE IRB AS PROVIDED BY UAB'S ASSURANCE. COMPLETION OF REVIEW WILL BE CERTIFIED BY ISSUANCE OF ANOTHER FORM 4 AS SOON AS POSSIBLE.
4. EXEMPTION IS APPROVED BASED ON EXEMPTION CATEGORY NUMBER(S) .

DATE: 10-7-96

Marguerite Kinney
MARGUERITE KINNEY, DNSc
VICE CHAIR OF THE
INSTITUTIONAL REVIEW BOARD

The University of Alabama at Birmingham
1170R Administration Building • 701 South 20th Street
Birmingham, Alabama 35294-0111 • (205) 934-3789 • FAX (205) 975-5977

APPENDIX B

RESEARCH QUESTIONNAIRE

Risk Reduction Behaviors Assessment

1. Name: _____
2. Age: _____
3. Sex: _____ M _____ F
4. Race: _____ African American _____ Caucasian American _____ Other
5. Height: _____ Weight: _____
6. Diagnosis: Primary _____
Secondary _____
7. Previous cardiac problems: _____
8. History of CVD in the family_if yes-who _____
9. Smoking History:
Do you smoke? _____ Yes _____ No (If no go to number 10).
How many per day? _____ Cigarette _____
Pipe _____
Smokeless tobacco _____
Indicate the total number of years you have smoked _____
Did you tried to quit the last year? _____ Yes _____ No
10. Exercise History:
If you do exercise How many times per day? _____
How long each session? _____
Where? _____
Type of exercise _____
11. Diet History:
Your regular meal contains: High amount of fat _____
Moderate amount of fat _____
Low amount of fat _____
Uncertain _____
12. Other than this problem,
do you see your doctor for annual checkup? _____
13. Address: _____

14. Phone Number: Day () _____
Evening () _____

ALL THE INFORMATION IS CONFIDENTIAL.

PRE

QUESTIONNAIRE

This survey will contain questions about smoking, diet, and exercise in relation to coronary artery disease. Please circle the number that best describes your opinion or degree of agreement with each statement

1-Strongly Disagree 2-Disagree 3-Uncertain 4-Agree 5-Strongly Agree

1. I intend to quit *smoking* within the next 30 days after PTCA. 1 2 3 4 5
2. It would be wise for me to quit *smoking* after PTCA. 1 2 3 4 5
3. Quitting smoking would require substituting something else for tobacco. 1 2 3 4 5
4. Quitting smoking would require participation in educational classes. 1 2 3 4 5
5. Quitting smoking would save me money. 1 2 3 4 5
6. People who are important to me think I should quit smoking. 1 2 3 4 5
7. Members of my family think I should quit smoking. 1 2 3 4 5
8. My close friends think I should quit smoking. 1 2 3 4 5
9. My health care providers think I should quit smoking. 1 2 3 4 5
10. It should be easy for me to quit smoking. 1 2 3 4 5
11. If I wanted to, I could easily quit smoking. 1 2 3 4 5
12. I have complete control over quitting smoking. 1 2 3 4 5
13. Even if I had a good reason, I could not bring myself to quit smoking. 1 2 3 4 5
14. Numerous things outside my control prevent me from quitting smoking. 1 2 3 4 5

1-Strongly Disagree	2-Disagree	3-Uncertain	4-Agree	5-Strongly Agree
15. I intend to follow an <i>exercise</i> program within the next 30 days after PTCA.				1 2 3 4 5
16. It would be wise of me to follow an <i>exercise</i> program after PTCA.				1 2 3 4 5
17. If I exercised more, I would have to spend less time watching TV.				1 2 3 4 5
18. Developing an exercise program will require doing exercises on a regular basis.				1 2 3 4 5
19. Walking short distance whenever possible instead of driving a car is good exercise.				1 2 3 4 5
20. Developing an exercise program requires participation in educational classes.				1 2 3 4 5
21. People who are important to me think I should develop an exercise program.				1 2 3 4 5
22. Members of my family think I should follow an exercise program.				1 2 3 4 5
23. My close friends think I should follow an exercise program.				1 2 3 4 5
24. My health care providers think I should follow an exercise program.				1 2 3 4 5
25. It should be easy for me to follow an exercise program.				1 2 3 4 5
26. If I wanted to, I could easily follow an exercise program.				1 2 3 4 5
27. I have complete control over following an exercise program.				1 2 3 4 5
28. Even if I had a good reason, I could not bring myself to follow an exercise program.				1 2 3 4 5
29. Numerous events outside my control prevent me from following an exercise program.				1 2 3 4 5

1-Strongly Disagree	2-Disagree	3-Uncertain	4-Agree	5-Strongly Agree
30. I intend to modify my <i>diet</i> within the next 30 days after PTCA.				1 2 3 4 5
31. It would be wise to modify my <i>diet</i> after PTCA.				1 2 3 4 5
32. If I decide to modify my diet, I would have to cut down on all starchy foods, such as bread.				1 2 3 4 5
33. Avoiding restaurants helps me cut my food intake.				1 2 3 4 5
34. Modifying my diet requires me to eat lighter meals.				1 2 3 4 5
35. Modifying my diet requires me to eat on a consistent and regular schedule.				1 2 3 4 5
36. People who are important to me think I should modify my diet.				1 2 3 4 5
37. Members of my family think I should modify my diet.				1 2 3 4 5
38. My close friends think I should modify my diet.				1 2 3 4 5
39. My health care providers think I should modify my diet.				1 2 3 4 5
40. It should be easy for me to modify my diet.				1 2 3 4 5
41. If I want to, I can easily modify my diet.				1 2 3 4 5
42. I have complete control over modifying my diet.				1 2 3 4 5
43. Even if I had a good reason, I could not bring myself to modify my diet.				1 2 3 4 5
44. Numerous events outside my control prevent me from modifying my diet.				1 2 3 4 5

For the following questions, please circle only the word that best fits the response.

- 1- The people/person **most** influencing me in
quitting smoking are/is my family friends doctor
- 2- The people/person **most** influencing me in
following an exercise program are/is my family friends doctor
- 3- The people/person **most** influencing me in
modifying my diet are/is my family friends doctor
- 4- The people/person **least** influencing me in
quitting smoking are/is my family friends doctor
- 5- The people/person **least** influencing me in
following an exercise program are/is my family friends doctor
- 6- The people/person **least** influencing me in
modifying my diet are/is my family friends doctor
- 7- I perceive my health status as very unhealthy average extremely healthy
- 8- Which one of these behaviors is important
for you to start working on? smoking diet exercise

APPENDIX C
INFORMED CONSENT

Informed Consent

"An Assessment of Post-PTCA Patients' Intentions to Reduce Risk Behaviors Associated with Coronary Artery Disease CAD"

You are being asked to participate in a study to assess the intentions to reduce risk behaviors associated with coronary artery disease CAD. The major controllable risk factors associated with CAD are smoking, hypercholesterolemia, and physical inactivity. Questions related to these risk factors will be included in the study.

If you decide to participate, you will be interviewed by the principal investigator, Mr. Wajih Ahmad, a day before the PTCA procedure prescribed by your physician. You will be asked to respond to a survey related to risk factors that will take approximately 15 minutes. You will be contacted by phone or by mail to complete a second survey that will also take about 15 minutes, 6 weeks after the procedure. Questions related to your intentions to reduce smoking, develop an exercise program, or modify your diet after PTCA will be asked. Your attitude toward these behaviors, behavioral beliefs, and the outcome evaluations related to these behaviors will be included. Also, your motivation to comply and your perceived behavioral control will be assessed.

In order to participate in this study you must have coronary artery disease (CAD), smoked during the month before the diagnosis, be recommended for PTCA by your physician, and be willing to provide information related to the risk factors described. All the information is confidential.

Your participation may provide valuable information about risk factors related to coronary artery disease, provide ways to develop better risk reduction educational programs.

There will be no cost to you for participating in this study. There are no risks in participating, and you may discontinue participating in the study at any time.

If, during the course of the study, you have any questions concerning the nature of the research or your rights as a subject, please contact Mr. Wajih Ahmad, the principal investigator of the study, at The University of Alabama at Birmingham, 901 13th Street So. Room 207 Education Building. Birmingham, AL 35294-1250; or call (205) 975 6166.

Mr. Ahmad and his staff will review your responses. Your identity will be explicitly guarded. You will not be contacted other than by Mr. Ahmad or his staff. Thank you in advance for your willingness to participate in this study.

Participant's Initials _____

I have read the description of the study and I have freely volunteered to participate in it. I have had benefits and risks explained and have had an opportunity to ask questions and have received acceptable answers. I understand that I may withdraw from the study at any time.

Signature of Participant

Date

Signature of Witness

Date

Signature of Investigator

Date

APPENDIX D

POST-PTCA QUESTIONNAIRE

POST

QUESTIONNAIRE

This survey will contain questions about smoking, diet, and exercise in relation to coronary artery disease. Please circle the number that best describes your opinion or degree of agreement with each statement.

1-Strongly Disagree 2-Disagree 3-Uncertain 4-Agree 5-Strongly Agree

If you have quit *smoking* after PTCA, please answer (1-5); otherwise, go to 6.

- | | |
|---|-----------|
| 1. It was wise for me to quit <i>smoking</i> after PTCA. | 1 2 3 4 5 |
| 2. Quitting smoking would required substituting something else for tobacco. | 1 2 3 4 5 |
| 3. Quitting smoking required participation in educational classes. | 1 2 3 4 5 |
| 4. Quitting smoking saved me money. | 1 2 3 4 5 |
| 5. It was easy for me to quit smoking. | 1 2 3 4 5 |
| 6. People who are important to me thought I should quit smoking. | 1 2 3 4 5 |
| 7. Members of my family thought I should quit smoking. | 1 2 3 4 5 |
| 8. My close friends thought I should quit smoking. | 1 2 3 4 5 |
| 9. My health care providers thought I should quit smoking. | 1 2 3 4 5 |
| 10. If I want to, I could easily quit smoking. | 1 2 3 4 5 |
| 11. I had complete control over quitting smoking. | 1 2 3 4 5 |
| 12. Even if I had a good reason, I could not bring myself to quit smoking. | 1 2 3 4 5 |
| 13. Numerous things outside my control prevented me from quitting smoking. | 1 2 3 4 5 |

1-Strongly Disagree 2-Disagree 3-Uncertain 4-Agree 5-Strongly Agree

If you have followed an *exercise* program after PTCA, please answer (14-19); otherwise, go to 20.

- | | |
|--|-----------|
| 14. It was wise for me to follow an <i>exercise</i> program after PTCA. | 1 2 3 4 5 |
| 15. If I exercised more, I would have to spend less time watching TV. | 1 2 3 4 5 |
| 16. Developing an exercise program required doing exercises on a regular basis. | 1 2 3 4 5 |
| 17. Walking short distance whenever possible instead of driving a car was good exercise. | 1 2 3 4 5 |
| 18. Developing an exercise program required participation in educational classes. | 1 2 3 4 5 |
| 19. It was easy to follow an exercise program. | 1 2 3 4 5 |
| 20. People who are important to me thought I should develop an exercise program. | 1 2 3 4 5 |
| 21. Members of my family thought I should follow an exercise program. | 1 2 3 4 5 |
| 22. My close friends thought I should follow an exercise program. | 1 2 3 4 5 |
| 23. My health care providers thought I should follow an exercise program. | 1 2 3 4 5 |
| 24. If I want to, I could easily have follow an exercise program. | 1 2 3 4 5 |
| 25. I had complete control over following an exercise program. | 1 2 3 4 5 |
| 26. Even if I had a good reason, I could not bring myself to follow an exercise program. | 1 2 3 4 5 |
| 27. Numerous events outside my control prevented me from following an exercise program. | 1 2 3 4 5 |

1-Strongly Disagree 2-Disagree 3-Uncertain 4-Agree 5-Strongly Agree

If you have modified your *diet* after PTCA, please answer (28-33);
otherwise, go to 34

- | | |
|--|-----------|
| 28. It was wise to modify my <i>diet</i> after PTCA. | 1 2 3 4 5 |
| 29. If I decide to modify my diet, I would have to
cut down on all starchy foods such as bread. | 1 2 3 4 5 |
| 30. Avoiding restaurants helped me cut my food intake. | 1 2 3 4 5 |
| 31. Modifying my diet required me to eat lighter meals. | 1 2 3 4 5 |
| 32. Modifying my diet required me to eat
on a consistent and regular schedule. | 1 2 3 4 5 |
| 33. It was easy to modify my diet. | 1 2 3 4 5 |
| 34. People who are important to me
thought I should modify my diet. | 1 2 3 4 5 |
| 35. Members of my family thought I
should modify my diet. | 1 2 3 4 5 |
| 36. My close friends thought I should modify my diet. | 1 2 3 4 5 |
| 37. My health care providers thought
I should modify my diet. | 1 2 3 4 5 |
| 38. If I want to, I could easily modified my diet. | 1 2 3 4 5 |
| 39. I had complete control over modifying my diet. | 1 2 3 4 5 |
| 40. Even if I had a good reason,
I could not bring myself to modify my diet. | 1 2 3 4 5 |
| 41. Numerous events outside my control
prevented me from modifying my diet. | 1 2 3 4 5 |

For the following questions, please circle only the word that best fits the response.

- 1- The people/person **most** influencing me in
quitting smoking were/was my family friends doctor
- 2- The people/person **most** influencing me in
following an exercise program were/was my family friends doctor
- 3- The people/person **most** influencing me in
modifying my diet were/was my family friends doctor
- 4- The people/person **least** influencing me in
quitting smoking were/was my family friends doctor
- 5- The people/person **least** influencing me in
following an exercise program were/was my family friends doctor
- 6- The people/person **least** influencing me in
modifying my diet were/was my family friends doctor
- 7- I perceive my health status as very unhealthy average extremely healthy
- 8- The most important behavior for me
to start working on was smoking diet exercise
9. **Smoking:**
Do you smoke? _____ Yes _____ No (If no go to number 10).
How many per day? Cigarette _____
Pipe _____
Smokeless tobacco _____
Indicate the total number of years you have smoked _____
Did you tried to quit the last year? _____ Yes _____ No
10. **Exercise:**
If you do exercise How many times per day? _____
How long each session? _____
Where? _____
Type of exercise _____
11. **Diet:**
Your regular meal contains: High amount of fat _____
Moderate amount of fat _____
Low amount of fat _____
Uncertain _____

**GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM**

Name of Candidate Wajih A. Ahmad

Major Subject Health Education/Promotion

Title of Dissertation An Assessment of Post-PTCA Patients' Intentions
to Reduce Risk Behaviors Associated with Coronary Artery
Disease (CAD)

Dissertation Committee:

Dr. David Macrina , **Chairman**

Dr. Judy Taylor, Co-Chair

Dr. Jim McLean

Dr. Steve Nagy

Dr. Larry Dean

Dr. Bonnie Sanderson

Director of Graduate Program

Dean, UAB Graduate School

(Signature of David Macrina)
(Signature of Judy Taylor)
(Signature of Jim McLean)
(Signature of Steve Nagy)
(Signature of Larry Dean)
(Signature of Bonnie Sanderson)
(Signature of J. F. Loden)

Date 9/24/97