Incidence Of Documented Exercise Prescription In Nurse Practitioner Client With A Diagnosis Of Cardiovascular Disease

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INCIDENCE OF DOCUMENTED EXERCISE PRESCRIPTION IN NURSE PRACTITIONER CLIENTS WITH A DIAGNOSIS OF CARDIOVASCULAR DISEASE

by

SHANNON D. PHILLIPS

A Thesis
Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Nursing in the Division of Nursing Mississippi University for Women

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1997
Incidence of Documented Exercise Prescription in Nurse Practitioner Client with a Diagnosis of Cardiovascular Disease

by

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Abstract

The purpose of this ex post facto descriptive study was to determine the incidence of documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease. Pender's Health Promotion Model provided the theoretical framework for this study. Nurse practitioners providing primary care in the State of Mississippi was the target population, with four nurse practitioners providing care in clinics representing the four geographical regions of Mississippi (Northeast, Southwest, Southeast, and Northwest) selected as a nonrandom sample of convenience. At each clinic, from the total population of records in which clients were aged 25 to 65 years with a diagnosis of cardiovascular disease, 25 client charts were selected for review by the researcher. Records were reviewed for incidence of exercise mention and incidence of exercise prescription. Data were collected using a researcher-designed chart review form. Two research questions guided this study: What is the incidence of documented exercise mention among
nurse practitioner clients with a diagnosis of cardiovascular disease and what is the incidence of documented exercise prescription among nurse practitioner clients with a diagnosis of cardiovascular disease?

Utilizing descriptive statistics, 8% of the charts reviewed contained documentation that the nurse practitioner had advised the client to exercise (exercise mention). Only 1% of charts reviewed contained an actual exercise prescription as specified by the operational definition. ANOVA was used to examine differences between groups. No significant differences existed among groups with regard to age, sex, or exercise prescription. However, a statistical difference at the .05 level was appreciated among groups with regard to documented exercise mention. The findings of this study demonstrate that nurse practitioners are well below the Healthy People 2000 goal which hopes to increase to 65% the number of health care providers routinely providing clients with an exercise prescription. Perhaps, as indicated by the practitioners in conversation with the researcher, clients are advised by the nurse practitioner to exercise, but exercise is not documented in the client record.
Recommendations for further research include conduction of a similar study using the survey method to determine nurse practitioner perception of incidence of exercise prescription and replication of the study using a larger sample size.
Acknowledgments

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Chapter I

The Research Problem

Cardiovascular disease is the leading cause of death in the United States, currently affecting more than 7 million Americans (Francis, 1996). Although research indicates that exercise may be effective in the prevention and treatment of cardiovascular disease, most Americans fail to participate in regular physical activity. Nurse practitioners are faced with the special challenge of encouraging healthy behaviors, including exercise, in clients diagnosed with cardiovascular disease.

Although exercise has long been regarded as an important component of a healthy lifestyle, approximately 50% of participants in supervised exercise programs abandon physical fitness plans within one year (Sallis, Hovell, & Hofstetter, 1992). Despite research findings suggesting an exercise prescription increases client compliance with physical activity programs (Jones & Eaton, 1995; Levine & Balady, 1993; Pender, 1996; Williford, Barfield, Lazenby, and Olson, 1992), exercise prescription
use among nurse practitioners is not documented in the literature. The purpose of this study was to describe the use of a documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease.

Establishment of the Problem

Over 60% of adult Americans are classified as sedentary and less than 8% exercise at a level sufficient to provide cardiorespiratory benefits (Jones & Eaton, 1995). Research indicates that lack of exercise results in increased morbidity and mortality for the sedentary individual (Karvonen, 1996). Sedentary living is estimated to relate to one third of deaths due to cardiovascular disease, with more Americans at risk for heart disease from lack of exercise than from smoking, hypertension, or increased cholesterol levels (Burns, 1996).

Sedentary living leads not only to increased morbidity and mortality for the individual, but also to an increased public health burden (Francis, 1996). Each year in the United States, 250,000 coronary artery bypass surgeries are performed at a cost of $30,000 for each procedure (Francis, 1996). Thirteen percent of the Gross National Product of the United States can be attributed to
health care expenditure "with the extrapolated cost of physical inactivity reaching $5.7 billion per year" (Francis, 1996, p. 458).

The most frequently reported barriers to exercise include lack of self-discipline, lack of knowledge about how to get involved, and lack of time (Sluijs, Kok, Van der Zee, Turk, & Riolo, 1993). Yet the average American spends 30 hours each week watching television (Jones & Eaton, 1995). By increasing patient self-efficacy and emphasizing benefits of exercise using Pender's Health Promotion Model as a theoretical framework, many individuals may be motivated to incorporate moderate physical activity into their daily schedules (Pender, 1996; Stott, Kinnersley, & Rollnick, 1994).

One method of improving compliance with exercise programs is the use of exercise prescriptions by primary care providers (Levine & Balady, 1993). Williford et al. (1992) define an exercise prescription as an "individualized schedule for physical fitness exercises that typically consists of the assessment and counseling of patients regarding the frequency, duration, type, and intensity of physical activity practices" (p. 631). Researchers have correlated exercise prescription use with
continued client participation in exercise programs. Even brief counseling about exercise has demonstrated a significant impact on client behavior (Levine & Balady, 1993). Jones and Eaton (1995) reported that 23% of physically active clients cited physician orders as motivation for participation in a regular exercise program, yet four out of five clients stated they had never been told by their physician to exercise.

One guideline delineated by the Healthy People 2000 Objectives suggests that at least 65% of primary care providers routinely provide clients with an exercise prescription (Williford et al., 1992). A great responsibility has been placed on primary health care providers to achieve this goal as the focus of health care continues to shift from the treatment of disease to prevention of disease and promotion of health (Lewis & Lynch, 1993; McLeroy & Crump, 1994). Nurse practitioners who provide individualized counseling to their clients regarding the benefits of regular physical activity may promote healthy behaviors between those clients and increase self-efficacy of patients (Pender, 1996; Stott et al., 1994).
However, recommending to clients that they just exercise is not sufficient. Development of effective exercise prescriptions requires study of the factors that influence adherence and methods of developing programs to match specific and changing needs of clients (Iliff, Tai, Gould, Thorogood, & Hillsdon, 1994). The involvement of the health care provider in promoting increased physical activity should include appropriate screening, evaluation of capabilities, counseling, and specific exercise prescription (Levine & Balady, 1993). The nurse practitioner should discuss rationale for health promotion activities and discuss with the client possible objectives to achieve exercise-fitness goals. The nurse practitioner should assist clients in setting conservative, realistic, short-term goals, then continue to follow up with the client at intervals to review and reevaluate these goals and provide feedback (Pate, 1995).

Significance to Nursing

The need for this study was based on the Healthy People 2000 objective that at least 65% of primary care providers routinely provide their clients with an exercise prescription (Burns, 1996). Nurse practitioners committing to this goal will impact the health of the nation by
decreasing individual morbidity and mortality of clients, thus reducing health care expenditure. Consequently, emphasis should be placed on the importance of specific exercise prescription in nurse practitioner education.

Although nurse practitioners are in a position to dynamically impact individual and national health through use of exercise prescriptions, in a review of literature no studies were identified in which nurse practitioners have used exercise prescriptions. Therefore, research in this area should begin with descriptive studies verifying exercise prescription use among nurse practitioners. Further research regarding use of the exercise prescription may then quantify benefits, determine appropriate teaching methods, and suggest methods to improve patient compliance with physical activity programs.

Theoretical Framework

Pender's (1996) Health Promotion Model provided the necessary theoretical framework for the study. According to Pender (1996), health promotion is defined as "encouraging healthy lifestyles, creating supportive environments for health, strengthening community action, reorienting health services, and building healthy public
policy" (p. 3). Use of the exercise prescription is only one component of health promotion.

The Health Promotion Model integrates nursing and behavioral sciences in delineating factors which influence health behaviors (Pender, 1996). Pender (1996) asserts that health promotion is motivated by individual desires to increase well-being and maximize personal health potential. The Health Promotion Model is often used as the framework for research aimed at predicting healthy lifestyles of individuals or groups, as well as predicting specific health behaviors such as exercise.

There are seven assumptions of Pender's Health Promotion Model:

1. People seek to create conditions of living through which they can express their unique human health potential.

2. People have capacity for reflective self-awareness, including assessment of their own competencies.

3. People value growth in directions viewed as positive and attempt to achieve a personally acceptable balance between change and stability.

4. Individuals seek to actively regulate their own behaviors.

5. Individuals in all their biopsychosocial complexity interact with the environment, progressively transforming the environment and being transformed over time.
6. Health professionals constitute a part of the interpersonal environment, which exerts influence on people throughout their life span.

7. Self-initiated reconfiguration of person-environment interactive patterns is essential to behavior change. (Pender, 1996, p. 55)

These assumptions emphasize the active role of the client in shaping and maintaining health behavior and in modifying his or her health environment.

The Health Promotion Model serves as a guide for exploring the complex processes which motivate humans to engage in healthy behaviors. Pender (1996) emphasized prior related behavior as a key motivational factor. Prior behavior is proposed by Pender (1996) as shaping all changes in thinking and behavior. If positive outcomes were experienced by the individual when previous health changes were implemented, the individual is more likely to adopt new health-promoting behaviors. Indirect influences on prior behavior include self-efficacy, perceived benefits of health behaviors, and perceived barriers to health-promoting behaviors (Pender, 1996).

Perceived self-efficacy is the belief of capability of the individual to execute a course of action. If an individual believes the behavior is possible, the occurrence of that behavior is positively influenced.
Self-efficacy is not concerned with the actual skills an individual possesses, but with what the individual perceives as his or her abilities. Thus, feeling skilled in a behavior is likely to encourage an individual to engage in the behavior more often (Pender, 1996).

Perceived benefits of behaviors constitute another major concept of the Health Promotion Model. Individuals may be more inclined to adopt and continue health promotion behaviors if the benefits of the behavior are perceived to be high. Benefits may be biologic, sociologic, psychologic, cultural, or a combination of these factors (Pender, 1996).

Barriers to action consist of perceptions concerning the unavailability, inconvenience, expense, or time-consuming nature of the behavior. Perceived barriers affect individual intentions to engage in the behavior or continue the behavior. Loss of satisfaction from giving up health-damaging behaviors, such as smoking, eating high-fat foods, or remaining physically inactive can also constitute a barrier to healthy behavior (Pender, 1996).

Health, in the Health Promotion Model, is seen as a positive state, and the individual is assumed to have a drive toward health. How an individual defines health
influences what health behavior changes will be attempted, and locus of control, or self-efficacy, determines perception of ability to change health (Pender, 1996).

According to Pender (1996), individual commitment to health consists of specific strategies for carrying out the behavior. Contracting between the client and nurse practitioner consists of "a mutually agreed upon set of actions to which one party commits with the understanding that the other party will provide some tangible reward or reinforcement if the commitment is sustained" (Pender, 1996, p. 72). The exercise prescription constitutes a form of contracting, with the nurse practitioner providing the definitive strategies the client may need to energize the original intention and reinforce successful behavioral changes. Thus, use of an exercise prescription may increase the likelihood that the exercise plan will be successfully implemented and continued by the client.

In summary, the Health Promotion Model represents interrelationships between cognitive-perceptual factors and other modifying factors, such as age, sex, race, and educational level, which influence the occurrence of health-promoting behaviors. The individual is the focus of the model, and the multidimensional nature of people
interacting with their environment as they pursue health is depicted (Pender, 1996). In order for nurse practitioners to develop effective exercise prescriptions, determinants of healthy behaviors must be identified. Pender's Health Promotion Model guides the nurse practitioner in discerning specific motivational factors of the client, thus optimizing the possibility the exercise plan will be adopted and continued.

Assumptions

This study was based on the following assumptions:

1. Clients with cardiovascular disease seek care from nurse practitioners.

2. Clients perceive health as a positive state to be actively pursued.

3. Exercise prescriptions can be identified and the incidence of such prescriptions can be empirically measured.

Purpose of the Study

The purpose of this study was to describe the incidence of documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease.
Statement of the Problem

Cardiovascular disease currently affects more than 7 million Americans and is the leading cause of death in the United States and in Mississippi (Francis, 1996; Mississippi State Department of Health, 1996). Significant amounts of research have indicated a positive correlation between increased levels of physical activity and decreased rates of all-cause and cardiovascular disease morbidity and mortality (Blair et al., 1995; Cupples & McKnight, 1995; Lee & Paffenbarger, 1996). Even minimal increases in physical activity levels have demonstrated a significant reduction in mortality rates (Blair et al., 1995).

Though lack of exercise contributes to increased rates of morbidity and mortality for the sedentary individual, use of an exercise prescription by physicians has been shown to motivate many clients to participate in regular exercise programs (Jones & Eaton, 1995). However, the incidence of exercise prescription use among nurse practitioners is unknown. The purpose of this study was to describe the incidence of documentation of an exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease.
Research Questions

The following research questions guided this study:

1. What is the incidence of documented exercise mention in nurse practitioner clients with a diagnosis of cardiovascular disease?

2. What is the incidence of documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease?

Definition of Terms

For the purpose of this research, the following terms were defined:

Documented exercise mention: written evidence of verbal communication between nurse practitioner and client where the nurse practitioner documents in the client record that he or she advised the client to exercise.

Documented exercise prescription: written evidence in the client record of verbal communication between nurse practitioner and client, which delineates a set of guidelines and instructions given to clients specifying type and duration of physical activity the client should perform to decrease the risk of morbidity and mortality for the client.
Nurse practitioner: a health care provider certified and practicing as a family or adult nurse practitioner in primary care in the State of Mississippi. Operationally, a nurse practitioner is that individual practicing as a nurse practitioner in one of the four clinics where data were collected.

Clients with a diagnosis of cardiovascular disease: For the purpose of this study, individuals aged 35 to 65 years with a documented diagnosis of hypertension, ischemic heart disease, previous myocardial infarction, hyperlipidemia, or atherosclerotic heart disease, and with no documented physical disabilities which exclude participation in exercise were included in the study.

Summary

In this chapter the problem was identified as unknown incidence of nurse practitioner use of exercise prescriptions despite research indicating that increased levels of physical activity significantly reduce morbidity and mortality among active individuals. Pender's (1996) Health Promotion Model was identified and discussed as the theoretical framework, definition of terms was provided, and significance of the study to nursing was addressed.
The following chapter will review literature applicable to the study.
Chapter II

Review of Literature

The purpose of this review of literature was to determine the status of current research relevant to exercise, nurse practitioners, and the exercise prescription. In the pursuit of research indicating a relationship among the variables of interest, no studies were discovered describing attitudes of nurse practitioners toward the exercise prescription or exercise prescription use by nurse practitioners. Therefore, in order to further clarify justification for the current study, the author reviewed topics relevant to the use of an exercise prescription by nurse practitioners. The emphasis of this literature review is to discuss the prevalence of sedentary lifestyle among Americans, the benefits of routine exercise, predictors of exercise adoption and maintenance, and attitudes of health care providers toward exercise.

The Centers for Disease Control and Prevention (CDC) used data from the Behavioral Risk Factor Surveillance
System ("Prevalence of Sedentary Lifestyle," 1991) to conduct a descriptive study with the purpose of establishing the prevalence of sedentary lifestyle of Americans and identifying groups characterized by a high prevalence of physical inactivity. Using a random digit-dialed telephone survey method, the CDC surveyed 87,433 respondents from 47 states and the District of Columbia aged 18 years and over. Respondents were asked to report the frequency, duration, and intensity of leisure time physical activity. Responses were categorized according to four levels of intensity: no physical activity; irregular activity; regular, but not intensive activity; and regular and intensive activity ("Prevalence of Sedentary Lifestyle," 1991).

Operational definitions were delineated. Regular activity was described as "less than 50% of predicted maximal cardiorespiratory capacity based on age," with intensive activity described as "50% or greater of the same value" ("Prevalence of Sedentary Lifestyle," 1991, p. 578). Sedentary individuals were defined as those who described frequency of physical activity as none or irregular. Demographic data also were obtained.
Data were analyzed using the Sesudaan method, a standard errors program for computing standardized rates from sample survey data. A total of 58.1% (n = 50,799) of the respondents was classified as sedentary. The number of respondents reporting no leisure-time physical activity was 29.8% (n = 15,138). The prevalence of physical inactivity did not differ by sex (57.7% for men and 58.5% for women). The prevalence of sedentary lifestyle was higher for other races (63.7%) than for non-Hispanic whites (56.7%) ("Prevalence of Sedentary Lifestyle," 1991).

Prevalence of sedentary lifestyle increased steadily with age. Respondents aged 18 to 34 years had an average sedentary rate of 54.6%; for people age 34 to 54 years the prevalence was 58.9%; and for respondents older than 55 years, the rate of inactivity was 61.9%. Prevalence of physical inactivity did not differ by sex for the youngest age group (55.0% for men and 54.2% for women). However, for the 35- to 54-year-old age group, men were more sedentary than women (60.9% versus 56.9%, respectively). For the oldest age group, women (64.9%) were more sedentary than men (59.1%) ("Prevalence of Sedentary Lifestyle," 1991).
Sedentary lifestyle was inversely related to income. Prevalence of inactivity was highest for those who earned less than $15,000 per year (65.0%) and lowest for those who earned greater than $50,000 per year (48.3%). Prevalence also was inversely related to education and was 71.9% among subjects with less than a 12th-grade education, compared with 50.1% among persons with a college education ("Prevalence of Sedentary Lifestyle," 1991). The findings of the study, based on the Behavioral Risk Factor Surveillance System, indicated the need for most Americans to increase physical activity levels in order to decrease their risk for premature morbidity and mortality.

Researchers began to correlate increased levels of physical activity with decreased mortality rates in the early 1960s. One of the earliest and most recognized studies is the Harvard Alumni Health Study which tested health benefits of exercise. A physical activity survey was completed by 14,785 male Harvard students in 1962 or 1966 and then again in 1977. The questionnaires included items eliciting sociodemographic characteristics, personal and family medical history, and health habits. Activity was assessed through self-report. Approximate number of
flights of stairs per day, number of city blocks walked daily, and type and duration of sports and recreational activities were described by subjects. Sports and recreational activities were classified by the researchers as light (requiring 5 kcal/min of energy expenditure, vigorous (10 kcal/min), and mixed (7.5 kcal/min) (Lee & Paffenbarger, 1996). Subjects were followed from 1977 until 1985 or death. Follow-up with subjects was 99% complete, with 1,413 men dying during the 12 years from initiation to conclusion of the study (Lee & Paffenbarger, 1996).

After adjusting for cigarette smoking, hypertension, weight for height ratio, and weight change since college, findings were significant in that mortality rates decreased with increased physical activity. Men expending between 3,000 to 3,499 kcal/wk had a 46% reduction in mortality compared to those men expending less than 500 kcal/wk (p ≤ .05). Subjects who were classified as inactive (< 2,000 kcal/wk) at baseline, yet converted to an active classification by the subsequent survey, had a 23% reduction in mortality rates when compared to subjects who were classified as inactive at both reviews (p ≤ .05). Men who were moderately to vigorously active at each
review had a 29% reduction in mortality compared to their inactive peers \( (p < .05) \) (Lee & Paffenbarger, 1996). Although one weakness of the design was collection of data through self-report, the Harvard Alumni Study demonstrated appreciable and significant reductions in mortality for physically active men.

More recently, Blair et al. (1995) conducted a study which reiterated the Harvard Alumni study using objective measures of physical activity change. Between December 1970 and December 1989, 9,777 men ages 20 to 82 years participated in the study designed to evaluate the relationship between changes in fitness levels and mortality risk in men.

Each participant completed at least two medical exams with an average between exams of 4.9 years \( (SD \pm 4.1 \) years, with a range of 1 to 18 years). Each exam included a physical, blood chemistry profile, and exercise treadmill testing. Participants were excluded if they failed to achieve at least 85% of their age-predicted maximal heart rate during each treadmill test. Subjects with normal resting and exercising electrocardiograms and with no history of myocardial infarction, stroke, diabetes, or hypertension at both exams were placed in the
healthy subgroup. Men with one or more of the aforementioned conditions at either exam were classified as unhealthy. For the purpose of the study, physical fitness was defined as "exercise test tolerance to a standard treadmill protocol, with physical fitness analogous to aerobic power, and change in fitness calculated as an increase in treadmill time" (Blair et al., 1995, p. 1096). The assumption by the researchers was that change in fitness level from test one to test two represented a physically active life (Blair et al., 1995).

Subjects were followed until death or until December 31, 1989. Death of subjects was verified via the National Death Index and the Department of Vital Statistics in each state. Only subjects who had completed both fitness exams were included in data analysis (n = 1,512) (Blair et al., 1995).

Proportional hazards regression was used to analyze change in fitness levels, Kaplan-Meier survival curves were used to evaluate survival among subjects, and multivariate regression was used to calculate all-cause and cardiovascular disease mortality. Participants were grouped according to age as follows: 20 to 39 years, 40 to 49 years, 50 to 59 years, and ≥ 60 years. Confidence
levels were established at 95% for each variable of interest (Blair et al., 1995).

After adjusting for age, health status, and other risk factors of premature mortality, the hypothesis that changes in physical fitness produce changes in mortality risk was supported. The highest death rate was observed in men who remained unfit at both exams, and the lowest death rate was in men who were physically fit at both exams. Men who improved from unfit to fit between the first and second examination had intermediate mortality rates. Subjects who were initially unfit and then became fit had a 44% reduction in all-cause mortality and a 52% reduction in cardiovascular disease mortality than their peers who were classified as unfit at both exams (p < .05) (Blair et al., 1995).

For all subjects in each age category, improved fitness levels were associated with a decreased risk of mortality. After adjusting for confounding variables, each minute of increased treadmill time from the first to the subsequent visit was associated with a 7.9% decrease in all-cause mortality (p < .001) and an 8.6% decrease in cardiovascular disease mortality (p < .027). An increased
treadmill time of 4 minutes correlated to a 30% estimated reduction in mortality risk (Blair et al., 1995).

Although limited because subjects predominantly represented white men from middle to upper socioeconomic classes, results of the Harvard Alumni Study and the study conducted by Blair et al. (1995) had implications for the current study in that an increase in physical activity levels led to decreased mortality rates for those subjects. It may consequently be extrapolated that use of exercise prescriptions by nurse practitioners may lead to increased levels of physical activity for clients, therefore, leading to decreased rates of client morbidity and mortality and decreased health care expenditure.

Though not directly related to use of the exercise prescription, Cupples and McKnight (1995) designed a prospective, randomized control trial to assess the value of secondary prevention through use of health education given to high-risk patients with angina, which supported the need for the current study. The researchers hypothesized that effective intervention would decrease the number of patients reporting severe angina attacks to 10% of the sample. Severe angina was defined as "attacks
occurring once or greater per day when walking, participating in sex or sports, shopping, or doing housework" (Cuppes & McKnight, 1995, p. 994).

General practitioners from 18 group practices in the Belfast, Ireland, area were asked to identify patients less than 75 years of age who had angina. The patients must have had angina for at least 6 months and could not have any other severe illness (Cuppes & McKnight, 1995). Angina was defined by the researchers as "recurrent, transient, and reproducible discomfort in the chest, arms, jaw, or shoulders, with the discomfort being reproduced by physical exertion or emotional excitement and relieved by rest or drugs" (Cuppes & McKnight, 1995, p. 993).

Requests were mailed to 1,431 patients asking for consent to be interviewed by a researcher about angina. Patients who agreed were interviewed in the home of the patient or at the clinic where the patient received health care. Trained research assistants questioned subjects regarding the frequency and duration of their angina attacks, limitations experienced due to angina, drugs taken, diet, and smoking habits. A questionnaire designed to assess intake of various types of foods also was administered (Cuppes & McKnight, 1995).
Subjects were questioned regarding frequency of physical activity, with exercise levels rated as the number of episodes each week of physical activity sustained for at least 20 minutes. Height, weight, and breath carbon monoxide levels were measured for each patient. Electrocardiogram, serum cholesterol levels, and urine samples were obtained (Cupplels & McKnight, 1995).

Subjects were then randomly assigned to one of two groups. For patients in the control group, no further measures were instituted. Patients in the experimental group were given health education regarding cardiovascular risk factors. Patients in the experimental group were interviewed at monthly intervals for 4 months with health education reiterated at each interview. After 2 years, the control group and experimental group were interviewed by a research assistant who had not been previously involved with the patients (Cupplels & McKnight, 1995).

Significance was set at the $\alpha = .05$ level. A small effect size estimated the need for 325 subjects in both the control group and the experimental group. A total of 688 patients entered the study. In the experimental group, 317 subjects completed the study, 13 died, and 12 were lost to attrition. In the control group, 346 patients
completed the study, 29 died, and 12 were lost to attrition. A final sample of 617 subjects remained (Cupples & McKnight, 1995).

Analysis between the two groups was conducted by chi-square. Analysis of variance was used to compare blood pressure, cholesterol levels, and body-mass index of the subjects. The t test compared differences between the groups, and logistic regression was used to compare mortality between the experimental and control groups (Cupples & McKnight, 1995).

No significant differences were found between the two groups at baseline with respect to any variable. At the 2-year review, several differences were found between the experimental and control groups. In relation to physical activity, 44% of the experimental group (n = 140) reported participation in daily physical activity, as compared to 24% of the control group (n = 70). Fewer subjects in the experimental group (28%) reported decreased levels of physical activity compared with the control group (54%). More members of the experimental group reported improved dietary habits compared with the control group. Significantly more of the experimental group (53%) reported prophylactic drug use compared with 40% of the
control group (p = .0004). Though the reported rate of smoking cessation was greater in the experimental group (21.5%) versus the control group (17.7%), this difference was not statistically significant (p = .82) (Cupple & McKnight, 1995).

Initially, there was no difference between the two groups in reported activity restriction. At the 2-year review, 8.5% (n = 27) of the experimental group claimed no limitation, compared with 2.7% (n = 8) of the control group (p = .003). There was no statistically significant decrease in patients with severe angina in the experimental group, thus the research hypothesis was rejected. Also, there was no statistically significant decrease in the mean episodes of angina attacks per week between the two groups (Cupple & McKnight, 1995).

No statistical difference was found at baseline or review with regard to systolic or diastolic blood pressure measurements, serum cholesterol levels, or body mass index between the two groups. Logistic regression did not explain the mortality difference between the two groups (Cupple & McKnight, 1995).

No differences existed in values of risk factors between the experimental and control groups, but patients
in the experimental group were significantly less restricted by their angina than members of the control group. Additionally, significantly more of the experimental group increased the frequency of their physical activity compared to members of the control group ($p < .0001$). Thus, although the hypothesis that intervention would decrease to 10% the number of subjects reporting severe angina was not supported, benefits for high-risk groups from secondary prevention were demonstrated. Also, changes in diet and activity levels may have had an effect on coronary mortality (Cuppes & McKnight, 1995). The study by Cupples and McKnight (1995) had implications for the current study in that a change in health behavior occurred after exercise and diet counseling, thus reducing patient mortality and morbidity secondary to cardiovascular disease and increasing quality of life by reducing restrictions from angina.

Sallis et al. (1992) also conducted a study designed to determine variables of exercise adoption and maintenance. Residents of San Diego, California, were randomly selected from a street directory listing. A researcher-designed survey was then mailed to residents, directed to one adult in the household. The seven-page
survey consisted of indices developed to assess physiological, psychological, social, and physical environment variables hypothesized to influence regular and vigorous exercise. Respondents were also asked to report historical and contemporary exercise habits. Two thousand fifty-three surveys were returned, a 43.4% response rate. Twenty-four months later a second survey was mailed to each individual who completed the first survey. Of those, 2,011 subjects were available for follow-up. An 85.5% response rate yielded a final sample of 1,719 subjects. The final sample consisted of 716 women and 1,003 men, aged 18 to 90 years with a mean age of 50.3 years (Sallis et al., 1992).

Frequency of vigorous activity was assessed in each survey by the question, "During a usual week, about how often do you do physical exercise in your free time for at least 20 minutes without stopping which is hard enough to make your heart rate and breathing increase a large amount?" (p. 240). Respondents reporting no vigorous physical activity were labeled as sedentary. Subjects reporting one to two sessions per week were placed in the intermediate category, and those reporting three or more sessions per week were categorized as active individuals.
Additionally, the question, "How many months of the past 24 have you been vigorously active at least nine times?" (p. 242) was asked. Participating in vigorous activity nine times per month is equal to 75% of the American College of Sports Medicine recommendation for activity which allows an individual to miss a few days of exercise a month and still be classified as active (Sallis et al., 1992).

Data analysis of those respondents returning surveys at baseline and at 24 months revealed that 40% of respondents were classified as sedentary, 16% placed in the intermediate category, and 40% were categorized as active individuals. Subjects classified as sedentary reported a mean months active of 4.6 (SD ± 7.8). Those placed in the intermediate category reported a mean months active of 9.0 (SD ± 8.4). Active individuals reported 17.7 mean months active (SD ± 8.0, p < .0001). Of those individuals categorized as sedentary at baseline, 60% continued to report no vigorous activity at follow-up. The remainder was divided into the intermediate and active groups. Of those reporting intermediate levels of exercise at baseline, 30% became sedentary and 35% were dispersed between the intermediate and active groups. Of those
classified as active at baseline, 70% remained active, with 15% to 20% falling into the other two groups (Sallis et al., 1992).

In order to assess age effects on exercise levels, researchers divided subjects into two groups: subjects aged 18 to 49 (n = 949) and those > 50 years (n = 737). Researchers found that among subjects reporting no vigorous activity at baseline, younger men and younger women were more likely to report an increase in activity levels. Among the intermediate group, older women were more likely to be reclassified as active at follow-up, with younger women increasing their exercise frequency. Older women who were classified as active at baseline were more likely than others to have stopped exercising at follow-up (Sallis et al., 1992).

Exercise adoption and maintenance were examined by stepwise logistic regression between potential predictors and the measurement of change in vigorous physical activity. Analysis was repeated for women and men in each exercise subgroup. Variables predicting change in exercise levels in sedentary men (n = 262) were self-efficacy (p < .0001; β= 0.25), perceived benefits, and physical activity history. Age was negatively associated with exercise
change among sedentary men ($p < .02; \beta = -0.025$) (Sallis et al., 1992).

Among sedentary women ($n = 198$), education level was the greatest predictor of exercise change, with exercise level increasing with education ($p < .003; \beta = 0.44$). Smoking was inversely related to exercise change. Women classified as sedentary at baseline who had begun some amount of regular physical activity at follow-up scored number of exercise models, family support, and friend support as significant predictors for changing exercise habits ($p < .03; \beta = 0.70$). Adoption of exercise among sedentary women was also influenced by self-efficacy ($p < .02; \beta = 0.14$) (Sallis et al., 1992).

Among the intermediate groups, few predictors of exercise change were noted. Intermediately active men ($n = 78$) reported exercise models as a positive predictor ($p < .03; \beta = 0.21$), with smoking affecting exercise adoption negatively ($p < .04; \beta = -0.07$). Women in the intermediate group ($n = 57$) rated athletic coordination as a positive predictor of vigorous exercise and body mass index as a negative predictor of vigorous physical activity ($p < .05; \beta = -0.14$). The older the women at baseline, the more likely she was to become sedentary (Sallis et al., 1992).
Vigorously active men \((n = 280)\) at baseline were most influenced by self-efficacy, perceived benefits, body mass index, and convenience \((p \leq .0001; \beta = 0.25)\). Age was negatively associated with vigorous activity at baseline \((p \leq .02; \beta = -0.03)\). The only predictor of vigorous activity in women \((n = 174)\) was education \((p \leq .01; \beta = 0.43)\) (Sallis et al., 1992).

The study by Sallis et al. (1992) suggests that predictors of exercise adoption and maintenance differ in men and women. Change in exercise levels in men were most affected by environmental variables (convenience of facilities) and personal variables (physical activity history). Women were more influenced by social variables (family support, friend support, and number of exercise models). Interestingly, self-efficacy was the only significant predictor for exercise change in both men and women. Therefore, results of the study by Sallis et al. (1992) had implications for the current study in that methods for increasing self-efficacy of clients may lead to adoption or maintenance of exercise programs.

The Health Promotion Model, of which perceived self-efficacy constitutes a significant variable, has been used by other researchers in predicting the probability a
client will engage in health-promoting behaviors. Fleetwood and Packa (1991) used Pender's Health Promotion Model as the framework for their study which sought to determine health-promoting behaviors of adults. Five hundred twenty military officers attending an educational course were questioned regarding coronary artery disease (CAD) risk, health promotion behaviors, value of health, and health locus of control. CAD risk factor knowledge was assessed with a 13-item, researcher-designed questionnaire; individual CAD risk was assessed with RISKO, an appraisal of cardiovascular risk developed by the American Heart Association; health-promoting behaviors were assessed with Pender's Health Promoting Lifestyle Profile; Health Locus of Control was assessed using the multidimensional health locus of control; and value of health was determined by subject rank of health importance (Fleetwood & Packa, 1991).

Descriptive statistics and Pearson r were used in analyzing data. With regard to CAD risk factor knowledge, 20% of subjects reported being told they were at risk for CAD, with risk factors identified by subjects as diet, family history, sedentary lifestyle, stress, cholesterol > 200 mg/dl, and smoking. Ninety percent of subjects had low
to moderate risk factors for CAD, and 4% were classified according to their responses as moderate to high risk for CAD. Seventy percent of subjects ranked importance of health as high on the health value survey, 21% of respondents ranked health as moderately important, and only 8% of subjects ranked importance of health as low (Fleetwood & Packa, 1991).

Mean scores on the Health-Promoting Lifestyle Profile (HPLP) were 131 with a range of 48 to 194. The six subscales of the HPLP were scored by subjects as follows: Self-actualization, 42 (range of 13 to 52), health responsibility, 22 (range of 10 to 40), exercise, 13 (range of 6 to 24), nutrition, 16 (range of 6 to 24), interpersonal support, 21 (range of 7 to 28), and stress management, 18 (range of 7 to 28). Subjects reporting knowledge of cardiovascular risks scored higher on the Health-Promoting Lifestyle Profile (HPLP). Subjects with higher HPLP scores also had increased internal health locus of control (IHLC) scores (p < .05). Results of the study indicate that knowledge of risk factors leads to an increase in health promotion behaviors. The study by Fleetwood and Packa (1991) supported Pender's Health Promotion Model in that a positive correlation was found
between health-promoting behaviors, internal locus of control, value of health, and CAD risk factor knowledge.

Gorin (1992) also used Pender's Health Promotion Model as the theoretical framework for a study which evaluated the attitudes and beliefs of student nurses regarding health promotion practices. A cross-sectional survey of 13 nursing schools in the New York Metropolitan area was conducted with 505 senior nursing students participating (Gorin, 1992).

Subjects completed the Nurses and Health Survey, with answers rated 1 (not important) to 5 (very important). The Pearson r measured significant associations among student nurses, and Kendall's coefficient of concordance (W = .259) measured agreement among raters (p < .0000). Data were reported in percentiles, means, and standard deviations (Gorin, 1992).

Subjects ranked health-promoting behaviors as follows: knowledge of drug contents and side effects (M = 4.65, SD ± .69), cigarette-smoking cessation (M = 4.64, SD ± .81), balanced diet (M = 4.64, SD ± .93), seat belt usage (M = 4.60, SD ± .80), cessation of cigar smoking (M = 4.59, SD ± .84), and low-fat diet (M = 4.58, SD ± .72). Neither regular exercise (M = 4.05, SD ± .95), baseline
exercising testing (M = 3.44, SD ± 1.10), nor annual exercising testing (M = 7.30, SD ± 1.17) was ranked in the top 10 (Gorin, 1992). Findings suggest that student nurses place less value on regular exercise than other health-promoting behaviors.

The study by Gorin (1992) had implications for the current study in that student nurses represent future nurses and nurse practitioners and may reflect attitudes and beliefs of nurse practitioners with regard to health promotion practices, including exercise. Gorin recommended that future studies concentrate on the relationship between attitudes and practices of health promotion. This recommendation was germane to the study of this author which described exercise prescription practices of nurse practitioners.

Sullivan (1996) studied health-promoting practices of nurse practitioners also using Pender's Health Promotion Model as the theoretical framework. Nurse practitioners employed in primary care in the State of Mississippi were surveyed using Pender's Health Promotion Lifestyle Profile II, a 52-item, 4-point Likert-type scale questionnaire which measures the frequency of self-reported health-promoting behaviors. A researcher-developed questionnaire
was used to solicit demographic data, contained open-ended questions reflecting personal beliefs with regard to health-promoting behaviors, and requested the nurse practitioners rank their health on a scale of 1 to 10 with 10 representing greatest health. Respondents (n = 183) had a mean age of 47.48 years (range of 25 to 67 years), and 92.9% were women with a mean height of 65.295 inches and a mean weight of 157.41 pounds (Sullivan, 1996).

The higher the score on the HPLP, the greater the health-promoting lifestyle of the nurse practitioner. Descriptive statistics revealed 31.1% of subjects (n = 57) reported no participation in moderate physical activity, 37.2% (n = 68) reported occasional physical activity, 18% reported participating in moderate physical activity on a frequent basis (n = 33), and only 13.7% (n = 25) reported routine physical activity of moderate intensity. With regard to the seven subscales of the HPLP, respondents ranked physical activity as third with a mean score of 2.336. A health-promoting lifestyle (M = 2.864) was reported by respondents most frequently, with health responsibility ranked second (M = 2.737) and nutrition (M = 2.836) following physical activity as the fourth most
frequent health practice among the nurse practitioners responding to the survey (Sullivan, 1996).

When asked in an open-ended question to describe factors which encouraged health-promoting practices, the majority of subjects responded that value of a healthy lifestyle ($n = 93$), professional knowledge ($n = 59$), love of family ($n = 35$), family history of illness ($n = 20$), and personal appearance ($n = 17$) constituted perceived benefits of healthy behaviors. Barriers to health-promoting behaviors included long work hours ($n = 115$), lack of willpower ($n = 47$), family ($n = 18$), lack of energy ($n = 13$), distance to or lack of facilities ($n = 11$), stress or anxiety ($n = 5$), and poor habits ($n = 5$) (Sullivan, 1996).

The third and fourth open-ended questions asked the nurse practitioner to describe his or her beliefs about teaching health-promoting practices to clients and whether or not their own health-promoting practices encouraged or discouraged health-promoting practices of clients. One-hundred and fifty-one subjects reported that the nurse practitioner was more likely to influence the client to practice healthy behaviors if the practitioner conducted such practices in daily life. Seventy-five practitioners
believed one could not effectively teach the client if they did not practice that behavior, and 16 subjects responded that personal health practices of the nurse practitioner had no effect on the client (Sullivan, 1996).

Spiritual growth achieved the highest mean score within the HPLP \( (M = 3.361) \). Interpersonal relationships were also scored high \( (M = 3.247) \), whereas health responsibility scored relatively low \( (M = 2.737) \). Physical activity received the lowest score with a mean of 2.336 \( (Sullivan, 1996) \).

The nurse practitioners represented in the study \( (Sullivan, 1996) \) reported minimal amounts of physical activity, with physical activity receiving the lowest mean score among all variables measured by the HPLP. These results are relevant to the current study in that attitudes of nurse practitioners toward exercise may affect their use of an exercise prescription.

While no specific research was found documenting the use of exercise prescriptions by nurse practitioners or describing attitudes of nurse practitioners with regard to development of exercise prescriptions, Williford, Barfield, Lazenby, and Olson (1992) designed a study to determine attitudes and practices of physicians related to
exercise as a form of health promotion and the development of exercise prescriptions. A questionnaire developed by a panel of physicians, nurses, and exercise physiologists was utilized to explore attitudes of physicians. Test-retest reliability scores on a sample of 50 subjects ranged from 0.95 to 0.98 for each multiple-choice question (Williford et al., 1992).

The questionnaire was mailed to 250 physicians who were randomly selected from a list of physicians obtained from the Board of Medical Examiners of the State of Alabama. Respondents were eliminated if demographic data revealed they did not live in the State of Alabama, had no direct patient contact, or specialized in an area with no logical relationship to exercise. Return yielded a sample of 168 physicians (a 69% response rate). Physicians composing the sample had a mean age of 45.5 ± 10.8 years with a range of 28 to 78 years. Eighty-seven percent of respondents were male, and 75% of the physicians practiced in family medicine or internal medicine specialties (Williford et al., 1992).

Descriptive statistics were used to analyze the data. Ninety-one percent of physicians responded that they encouraged their patients to exercise, but only 30%
reported routine development of exercise prescriptions. Nine percent stated they did not recommend exercise to their patients, and less than one half (48%) required an exercise history as part of an initial exam. Only 23% of respondents were familiar with the American College of Sports Medicine's guidelines related to exercise prescription. Only 3% of physicians had taken a college level course related to exercise, but 78% felt there was a need for a course in medical school related to exercise. When asked to whom patients were referred for exercise prescription, 68% of physicians referred patients to physical therapists, 9% referred to exercise physiologists, and 3% of physicians referred patients to nurses. Thirteen percent of the physicians indicated that they had staff members who developed exercise prescriptions for their patients (Williford et al., 1992).

The researchers concluded that physicians generally support exercise as an important component of health promotion and disease prevention, but because medical schools place little emphasis on exercise prescription, physicians may be uncomfortable with this aspect of preventive care due to lack of education. Possible reasons physicians often do not counsel patients regarding
exercise according to Williford et al. (1992) included lack of confidence in counseling patients, lack of standard formats for prescribing exercise, and lack of knowledge related to medical aspects of exercise. The high rate of referrals to physical therapists probably represents physician familiarity with this occupation with regard to exercise counseling (Williford et al., 1992).

Based upon the findings of this study, recommendations given by the researchers were aimed at meeting the objectives of Healthy People 2000 which hopes to increase to 65% the number of primary care providers who assess and counsel patients regarding leisure-time physical activity. With respect to this objective, physicians surveyed were well below the goal of 65%, with only 30% of the physicians routinely developing exercise prescriptions (Williford et al., 1992).

Williford et al. (1992) encouraged education and standardization in order to meet the Healthy People 2000 objectives. Specific recommendations given by the researchers included the development of standardized questionnaires to be utilized in obtaining an exercise history as part of each initial exam and education of primary care providers regarding the American College of
Sports Medicine's guidelines leading to the development of individualized exercise prescriptions.

In 1992 the National Committee of Clinical Preventive Services, a subsidiary of the Office of Disease prevention, surveyed five primary care provider groups in the United States also with regard to the Healthy People 2000 objectives delineated by the Centers for Disease Control and Prevention. The purpose of the survey was to collect data demonstrating utilization of preventive services by primary care providers (Lemley, O'Grady, Rauckhorst, Russell, & Small, 1994).

The survey consisted of five parts: (a) Demographics, (b) Preventive Health Services, (c) Counseling and treating who need intervention, (d) Basic screening and immunization services, and (e) Office resources for preventive service delivery. Items 2 through 5 also asked the primary care provider to give his or her best estimate of the percentage of patients who routinely received services. Responses of subjects were grouped into one of four categories: areas where the primary care providers met or exceeded the Healthy People 2000 target goal, areas where the providers were close to target goal (≤ 10% below target), areas where moderate progress is needed to reach
the target goal (11% to 20% < target), and areas where the most progress is needed by providers in order to reach the target goal by the year 2000 (≥ 20% below target) (Lemley et al., 1994).

Members of the National Alliance of Nurse Practitioners (NANP), a coalition of 12 national and state nurse practitioner organizations, participated in the study. NANP members were randomly selected for survey using NANP member lists (N = 13,465). After discarding incomplete surveys, a final sample of 892 remained (68% of original sample). The mean age of the nurse practitioners responding to the survey was 44 years with a range of 27 to 72 years. The majority of practitioners (33%) reported practicing in cities (population 50,000 to 249,999). Only 5% of the sample reported rural practices (population < 2,000), and 18% to 23% reported "town" practices (population 2,500 to 49,999). The remainder of nurse practitioners responding (44%) reported practicing in metropolitan and greater metropolitan areas (population 250,000 to 999,999 (Lemley et al., 1994).

Findings, which were reported by Lemley et al. (1994) indicated that nurse practitioners participating in the 1992 study exceeded the Healthy People 2000 target goal in
the areas of assessment of emotional and behavioral function, family planning, and preconception care. Participating nurse practitioners were close to target goals in the areas of physical exercise assessment and cognitive function. Areas requiring moderate progress by nurse practitioners in order to reach target goals included assessment of nutrition, seat belt or car seat use, smoking, alcohol and illicit drug use, and occupational health risks. Findings also indicated that although nurse practitioners generally score well in relation to preventive service assessment, the percentage of nurse practitioners reporting preventive service intervention was somewhat low. (No alpha levels were reported.) The authors recommended using the results of this study to guide nurse practitioner education (Lemley et al., 1994).

Although the study was limited in that only a small fraction of practicing nurse practitioners was actually surveyed, findings had implications for the current study in that assessment of physical activity in clients was below the Healthy People 2000 goal. Because the variable exercise prescription was not analyzed in the study, the rate of exercise prescription by participants is unknown.
However, because the percentage of nurse practitioners reporting preventive service interventions was somewhat low, it may be assumed that the rate of exercise prescription was below the Healthy People 2000 target also. The goal of the current research is to clarify the incidence of exercise prescription use among nurse practitioners in relation to the Healthy People 2000 objective that 65% of all primary care providers routinely provide clients with an exercise prescription.

In summary, the cited studies documented the prevalence of physical inactivity among Americans, the benefits of routine exercise, effectiveness of secondary prevention among high-risk groups, predictors of exercise adoption and maintenance, and attitudes of health care providers toward exercise. The association has been made between use of exercise counseling and exercise prescription with increased rates of physical activity among high-risk groups, thereby decreasing risk of mortality from cardiovascular disease. These findings had implications for the selection of clients with a diagnosis of cardiovascular disease in the current study. However, no research has examined the incidence of exercise prescription use among nurse practitioner clients.
Therefore, research should begin with descriptive studies concerning exercise prescription use among nurse practitioners.
Chapter III
The Method

Industrialization has led to decreased levels of physical activity in Americans. Consequently, rates of cardiovascular disease have increased. As continued research demonstrates a positive correlation between increased levels of physical activity and decreased risk of cardiovascular morbidity, exercise prescription use will become a significant predictor of positive outcomes. Nurse practitioners have the opportunity to dynamically impact the health of clients and drastically reduce health care costs through appropriate use of exercise prescriptions. Therefore, the purpose of this study was to describe the incidence of documented exercise prescription use among nurse practitioner clients with a diagnosis of cardiovascular disease.

Design of the Study

A quantitative, retrospective, descriptive design was employed in the study to determine the incidence of documented exercise prescription in nurse practitioner
clients with a diagnosis of cardiovascular disease. The descriptive design has as its main objective, “the accurate portrayal of the characteristics of individuals, situations, or groups and the frequency with which certain phenomena occur” (Polit & Hungler, 1995, p. 640). A descriptive design is appropriate when the researcher seeks only to describe a phenomenon rather than explain it and should be employed when little research has been conducted in the area of interest (Polit & Hungler, 1995). The nonrandom sample was one of convenience, and a researcher-developed chart review form was used to obtain data.

Variables

For this study the controlled variables were certified nurse practitioners providing primary health care in the State of Mississippi and limitation of nurse practitioner specialties to adult and family nurse practitioners. The variable of interest was the exercise prescription as documented by nurse practitioners.

Population, Setting, and Sample

Nurse practitioners providing primary health care in the State of Mississippi were selected as the target
population, with four nurse practitioners practicing in clinics representing the four geographical regions of Mississippi (Northeast, Southwest, Southeast, and Northwest) selected as a nonrandom sample of convenience. Because 65% of the population of Mississippi live in areas classified as rural (U.S. Bureau of the Census, 1997), the selected clinics were located in rural areas of the state.

From the total population of records in which clients were aged 25 to 65 years with a diagnosis of cardiovascular disease, a final sample of 100 charts was selected for review by the researcher. Twenty-five charts were selected from each of the four clinics. For the purpose of this study, individuals with a documented diagnosis of hypertension, ischemic heart disease, previous myocardial infarction, hyperlipidemia, or atherosclerotic heart disease, and with no documented physical disabilities which exclude participation in exercise were included in the chart review of 100 clients.

Currently, over 800 nurse practitioners are certified to practice in the State of Mississippi (Mississippi State Board of Nursing, 1997). With only 132 doctors per 100,000 civilian population, nurse practitioners in Mississippi provide primary care for a vast number of Mississippi
residents. Nurse practitioners in Mississippi are faced with distinct challenges as they confront the multifaceted health care dilemmas of the 2,697,243 residents of the state (U.S. Bureau of the Census, 1997).

In 1995 Mississippi was classified as the poorest state in the nation, with a per capita personal income of $15,371. Currently, approximately 20% of residents live below the poverty level. Among residents 25 years of age and older, only 64.3% have received a high school diploma, with a mere 14.7% having earned a college degree (U.S. Bureau of the Census, 1997). As previously established, rates of exercise participation are lowest among the poorest and least educated ("Prevalence of Sedentary Lifestyle," 1991). No doubt physical inactivity contributes to the high rate of heart disease within the state. Mississippi leads the nation in number of deaths from heart disease, with rates > 300 per 100,000 population ("Heart Disease for White Male," 1997).

Method of Data Collection

After obtaining approval from the Committee on Use of Human Subjects in Experimentation at Mississippi University for Women (see Appendix A), four nurse practitioners providing primary care in the state of
Mississippi were selected as a nonrandom sample of convenience. The four nurse practitioners selected practiced in rural clinics representing the four geographical regions of the State of Mississippi: Northeast, Southwest, Southeast, and Northwest. A cover letter describing the study and a consent form were then mailed to each of the four practitioners (see Appendices B and C). After one week, each practitioner was contacted by telephone. Any questions or concerns of the practitioner were addressed by the researcher, and a date for data collection was arranged.

On the date designated for data collection, verbal consent was again obtained from each nurse practitioner to review his or her client charts. In order to protect the privacy of practitioners and clients, each clinic was assigned an identifying letter, with each client record receiving an identifying number.

At each clinic, charts were randomly selected from the total population of client charts. The first 25 charts from each clinic in which the client met the aforementioned criteria were selected to review by the researcher using a researcher-designed chart review form (see Appendix D). The form delineated client age, client
sex, client race, documented exercise mention, and documented exercise prescription. Charts were not utilized by the researcher if clients were not between the ages of 35 and 65 years, did not have a diagnosis previously delineated, or had documented evidence of physical disability which would exclude participation in a physical activity program. Examples of diagnoses which excluded clients from study included stroke, rheumatoid arthritis, amputations, pressure ulcer, or documented disability.

Method of Data Analysis

Data were analyzed using descriptive statistics. Percentiles and measures of central tendency were used to describe the incidence of documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease. Descriptive statistics are appropriate to use when the researcher seeks only to describe a phenomenon rather than explain it (Polit & Hungler, 1995). Analysis of variance compared differences among the four clinics with regard to the variables of age, sex, exercise mention, and exercise prescription.
Summary

The intention of the study was to describe the incidence of documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease. Nurse practitioners providing primary care in the State of Mississippi were selected as the target population. Four nurse practitioners practicing in rural clinics representing the four geographical regions of Mississippi were selected as a sample of convenience. Data were collected using a researcher-designed chart review form. Descriptive statistics and analysis of variance were used to analyze the data.
Chapter IV

The Findings

The purpose of this study was to describe the incidence of documented exercise prescription in nurse practitioner clients with a diagnosis of cardiovascular disease. The type of research employed in this study was descriptive ex post facto. Data were collected using a researcher-designed chart review form. The subjects were divided into four groups according to geographical location, and data were analyzed using descriptive statistics and analysis of variance (ANOVA). In this chapter, the sample will be described and findings from data analysis will be presented.

Description of Sample

Four nurse practitioners practicing in clinics representing the four geographical regions of Mississippi provided a sample of convenience. From each clinic, 25 client records were reviewed for documented evidence of either the mention of exercise or an exercise prescription. The 100 records were divided into four
groups of 25 according to geographical location of the clinic where care was provided. The groups were divided as follows: (a) Group A, the 25 records of the clients who received care from the nurse practitioner practicing in the clinic representing the Northeast region of Mississippi; (b) Group B, the 25 records of the clients who received care from the nurse practitioner practicing in the clinic representing the Southwest region of Mississippi; (c) Group C, the 25 records of the clients who received care from the nurse practitioner practicing in the clinic representing the Southeast region of Mississippi; and (d) Group D, the 25 records of the clients who received care from the nurse practitioner practicing in the clinic representing the Northwest region of Mississippi. The final sample consisted of 100 client records in which subjects ranged in age from 35 to 65 years with a mean age of 52.3 years (SD ± 8.56). Sixty (60%) of the sample were female and 40 (40%) were male. Eighteen (18%) were White, 37 (37%) were Black, and 45 (45%) of the charts reviewed did not specify the race of the client. Raw data representing characteristics of the sample may be found in Appendix E.
Findings Related to the Research Questions

The study addressed the following questions: What is the incidence of exercise mention among nurse practitioner clients with a diagnosis of cardiovascular disease and what is the incidence of exercise prescription among nurse practitioner clients with a diagnosis of cardiovascular disease? One hundred charts of clients receiving care from nurse practitioners were reviewed for evidence of documentation of an exercise mention or an exercise prescription. A researcher-designed chart review form was used to collect the data. Eight (8%) of the charts reviewed contained documentation that the nurse practitioner had advised the client to exercise (exercise mention). Only 1 (1%) chart reviewed contained an actual exercise prescription as specified by the operational definition. Specific findings by group follow:

Group A. Group A consisted of 25 clients receiving treatment at the clinic located in the northeastern region of Mississippi. The age range was 36 to 65 years with a mean age of 51.2 (SD ± 9.55). Sixteen (64%) of these subjects were female and 9 (36%) were male. Four (16%) of the subjects were White, 2 (8%) of the subjects were Black, and 19 (76%) of the charts reviewed did not specify
race of the individual. Three (12%) of these clients received an exercise mention with one client (4%) receiving an exercise prescription from the nurse practitioner.

**Group B.** Group B consisted of the 25 clients receiving treatment at the clinic located in the southwestern region of Mississippi. The age range was 37 to 63 years with a mean age of 50.6 (SD ± 8.44). Fourteen (56%) of these subjects were female and 11 (44%) were male. Eight (32%) of the subjects were White, 1 (4%) of the subjects was Black, and 16 (64%) of the charts reviewed did not specify race of the individual. None of the clients receiving care at Site B were advised to exercise. No exercise prescriptions were documented.

**Group C.** Group C consisted of the 25 clients receiving treatment at the clinic located in the southwestern region of Mississippi. The age range was 37 to 63 years with a mean age of 51.76 (SD ± 8.06). Twelve (48%) of these subjects were female and 13 (52%) were male. Six (24%) of the subjects were White, 9 (36%) of the subjects were Black, and 10 (40%) of the charts reviewed did not specify the race of the client. There was no
evidence of documented exercise mention or exercise prescription for the clients in Group C.

**Group D.** Group D consisted of the 25 clients receiving treatment at the clinic located in the northwestern region of Mississippi. The age range was 35 to 65 years with a mean age of 55.6 years (SD ± 7.68). Eighteen (72%) of the subjects were female, and 7 (28%) were male. Twenty-five (100%) of the subjects were of the Black race. Five (20%) of the subjects were advised by the nurse practitioner to exercise (exercise mention), although there was no evidence of documented exercise prescription.

**Additional Findings**

Additional statistical analysis was conducted to discern information regarding differences among the four groups. Analysis of variance (ANOVA) was used to examine these differences.

ANOVA revealed no significant differences among groups with regard to age, sex, or exercise prescription. However, a statistical difference was appreciated among the groups with regard to documented exercise mention (see Tables 1, 2, 3, and 4).
### Table 1

**Comparison of Age Among Groups Using ANOVA**

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$p > .05$.

### Table 2

**Comparison of Sex Among Groups Using ANOVA**

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$p > .05$. 
Table 3

Comparison of Exercise Mention Among Groups Using ANOVA

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*p > .02.

Table 4

Comparison of Exercise Prescription Among Groups Using ANOVA

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p > .05.
Limitations

This study was greatly limited by the small sample size and the fact that the target population was confined to one geographical location, the State of Mississippi. Over 800 nurse practitioners representing a variety of specialties are currently certified in the State of Mississippi alone (Mississippi State Board of Nursing, 1997). Although this researcher suspects no significant differences would be appreciated between the practices of the four nurse practitioners who were included in the study and those nurse practitioners who were not included in the study, it cannot be assumed that the rate of exercise prescription among all nurse practitioners would be equal. Therefore, the rate of exercise mention and exercise prescription reported in this study may be unusually low. Also, from the thousands of charts which may have been selected, only 25 charts from each clinic were chosen to review. Researcher error may have also unintentionally contributed to low rates of exercise prescription. An overlooked exercise mention or documented disability may have altered the results slightly.
Summary

The purpose of the study was to describe the incidence of exercise prescription among nurse practitioner clients with a diagnosis of cardiovascular disease. Four clinics representing four geographical regions of Mississippi where nurse practitioners provide care provided a sample of convenience. Twenty-five client records from each of the four clinics were reviewed for evidence of documentation of exercise teaching. A researcher-designed chart review form was used to obtain the data. The review of charts provided data to describe the incidence of exercise prescription among nurse practitioner clients with a diagnosis of cardiovascular disease.
Chapter V
The Outcomes

In recent years health care providers have emphasized health-promoting practices rather than treatment of illness. The role of physical activity in disease prevention has gained significant popularity as repeated research has demonstrated the benefit of regular exercise in reducing morbidity and mortality rates for participants. Health care providers have been challenged by the goals of Healthy People 2000 to provide clients with a prescription for exercise. With an educational emphasis on health promotion, nurse practitioners may become a determining factor in the health of the nation. The purpose of this study was to determine the incidence of exercise prescription among nurse practitioner clients with a diagnosis of cardiovascular disease. All certified nurse practitioners practicing in the State of Mississippi were the target population. The sample consisted of four nurse practitioners practicing in primary care clinics representing the four geographical regions of Mississippi.
(Northeast, Southeast, Southwest, and Northwest). Data were collected through a review of 100 client records (25 from each clinic) using a researcher-designed chart review form. The form specified age, sex, race, incidence of exercise mention, and incidence of exercise prescription. Data were analyzed using descriptive statistics and ANOVA. In this chapter, the outcomes of the study are presented.

Summary and Discussion of the Findings

Incidence of exercise mention and incidence of exercise prescription were evaluated by the researcher. Data were obtained through a review of 100 client records, 25 records from each of the four nurse practitioner clinics representing the four geographical regions of Mississippi.

When compared with other states, Mississippi is consistently classified among the poorest, least educated, and least healthy (Mississippi State Department of Health, 1996). These demographics are often associated with low levels of physical activity as supported by the CDC's Behavioral Risk Factor Surveillance System which found that sedentary lifestyle was inversely related to income and education ("Prevalence of Sedentary Lifestyle," 1991). Mississippi leads the nation in number of deaths caused by
cardiovascular disease, perhaps secondary to low levels of physical activity among the residents of the state (Mississippi State Department of Health, 1997). In 1996 Mississippians were among the most overweight in the nation with less than 40% of adults getting less than 30 minutes of moderate to vigorous exercise at least three times per week (Mississippi State Department of Health, 1996).

Nurse practitioners practicing in Mississippi are challenged to positively influence the poor health habits of the residents of the state. However, in a review of 100 client records, only 8% contained documented mention of exercise. Only 1% contained a documented exercise prescription as delineated by the operational definition. These values are well below the Healthy People 2000 goal which hopes to increase to 65% the number of health care providers routinely providing clients with an exercise prescription. Results of the current study also support those of Lemley et al. (1994) who reported that although nurse practitioners generally score well in relation to preventive service assessment, the percentage of practitioners providing preventive service intervention is low.
In conversation with the researcher, each of the nurse practitioners providing care where the data were collected asserted that she frequently encouraged clients to exercise, but did not document the conversation on the patient record. One may assume this is often the case. However, any care provided by the nurse practitioner which has not been documented in the patient record cannot be validated. Research utilizing self-report through survey may be indicated in order to examine the relationship between verbal communication and documentation.

Using a questionnaire designed to explore attitudes of physicians toward exercise, Williford et al. (1992) found that while 91% of physicians responded that they encouraged their clients to exercise, only 30% reported routine development of exercise prescriptions. These findings support the contention that other health care providers, including nurse practitioners, do encourage their clients to exercise even if there is no documented evidence to support that fact.

Possible explanations given by physicians regarding low levels of exercise prescription included lack of confidence in counseling patients, lack of standard formats for prescribing exercise, and lack of knowledge
related to medical aspects of exercise. Seventy-eight percent of the physicians in the Williford et al. (1992) study cited a need for a course related to exercise in medical school. Only 3% of the physicians stated that they had taken any college level course related to exercise, and 80% of physicians surveyed referred clients to other health care providers when an exercise prescription was needed (Williford et al., 1992).

The lack of exercise prescription use among the nurse practitioners surveyed in the current study may therefore be related to nurse practitioner education. The significant difference with regard to exercise mention among the four groups surveyed may also result from differences in nurse practitioner education. These suppositions indicate that a survey of nurse practitioners designed to determine perceived barriers to exercise prescription use and educational needs related to composition and application of exercise prescriptions would be helpful.

One possible explanation for the lack of exercise prescription use among nurse practitioners may exist within the context of the study conducted by Gorin (1992). Student nurses were surveyed concerning their attitudes
and beliefs regarding health promotion practices. The student nurses assigned a high significance to smoking cessation, balanced diet, seat belt usage, and low-fat diet. Regular exercise and the need for exercise testing were given low scores by the student nurses. Perhaps this attitude reflects beliefs by nurse practitioners as well.

Sullivan (1996) provides yet another explanation for low rates of exercise prescription among nurse practitioners. In the Sullivan (1996) study, health-promoting practices of nurse practitioners were surveyed. The nurse practitioners responding to the survey reported minimal amounts of physical activity. Also, physical activity received the lowest score among all measured variables. Sullivan (1996) also included an open-ended question which asked the nurse practitioner to describe his or her beliefs regarding the teaching of health-promoting practices to clients and whether or not they perceived their own health-promoting practices to influence the behavior of the client. Interestingly, 151 subjects responded that the nurse practitioner was more likely to positively influence the health-promoting behaviors of clients if they also practiced the behavior, and 75 practitioners surmised that one could not
effectively teach that client if they did not practice the behavior themselves. The results of the study by Sullivan (1996) support the proposition of this author that because nurse practitioners do not exercise at recommended levels themselves they may not be as likely to prescribe exercise for their clients.

Findings Relevant to the Theoretical Framework

The findings of the current study support the use of Pender's Health Promotion Model in practice. In the Health Promotion Model, Pender (1996) identifies self-efficacy, perceived benefits of healthy behaviors, and perceived barriers to health-promoting behaviors as influences on individual behavior. Using the Health Promotion Model, the nurse practitioner may ascertain motivational factors of the client and use these factors to devise and utilize an exercise prescription in conjunction with the client. In this way the client will be more likely to comply with the prescribed regimen.

One may also apply the mechanisms of self-efficacy, perceived benefits, and perceived barriers to illustrate the potential reasons nurse practitioners do not provide clients with an exercise prescription. Perceived self-
efficacy is the belief of capability of the individual to execute a course of action. If the nurse practitioner does not recognize the importance of providing an exercise prescription, it is unlikely that behavior will occur. Perceived barriers to exercise prescription may include lack of knowledge, lack of time, self-consciousness regarding the physical activity practices of the nurse practitioner, or lack of belief that the exercise prescription will motivate the client to change. Further research is needed to clarify these conjectures. Potential benefits of behaviors could serve as motivational mechanisms as the nurse practitioner realized the advantages of a routine exercise program for the client and the practitioner.

Implications for Nursing

The findings from this study demonstrate that nurse practitioners are well below the Healthy People 2000 goal which hopes to increase to 65% the number of health care providers routinely providing clients with an exercise prescription. Implications for nursing research, nurse practitioner practice, and education may be derived from these findings.
Research. Future research should further clarify exercise prescription use among nurse practitioners, examine perceived barriers of nurse practitioners regarding use of exercise prescriptions, and objectively measure the benefits of the exercise prescription with regard to adoption and maintenance of routine exercise plans.

Practice. The low incidence of documented exercise prescription among the nurse practitioners surveyed indicates a need for practice innovations. Williford et al. (1992) recommended standardization as a possible method of increasing exercise prescription use among health care providers. Pre-printed forms delineating exercise type, duration, and frequency of clients should be completed in conjunction with the medical history and physical examination. A standardized form would prompt an exercise assessment, provide a visual reminder to the nurse practitioner to discuss physical activity practices with the client, and serve as documentation that an exercise prescription was discussed.

Nurse practitioners must also consider the influence that their personal exercise habits have on practice issues. As Sullivan (1996) demonstrated, many nurse
practitioners feel they cannot effectively encourage clients to engage in the healthy behaviors if the nurse practitioner does not engage in that behavior also. Nurse practitioners should be encouraged to practice health-promoting behaviors in order to positively affect the health of clients.

Education. Nurses and nurse practitioners should be trained to routinely assess the physical activity practices of all clients when obtaining the medical history and review of systems. Also, specific recommendations should be generated regarding exercise prescription development and should be incorporated into nursing education so that an exercise prescription may be provided when appropriate.

Conclusions

Based on the findings of this descriptive study regarding documentation of exercise prescription use among nurse practitioners, the following conclusions were drawn:

1. The incidence of exercise mention among nurse practitioner clients with a diagnosis of cardiovascular disease was 8%.
2. The incidence of exercise prescription among nurse practitioner clients with a diagnosis of cardiovascular disease was 1%.

3. There was a significant difference between the nurse practitioner located in the northwest region of the State of Mississippi and the remaining three nurse practitioners surveyed with regard to documented exercise mention.

Recommendations

Based on the findings of this study, the following recommendations for future research, nursing practice, and nursing education were made:

Research

1. Replication of the study using a larger sample size of both nurse practitioner practice sites and client records.

2. Replication of the study in other states for comparison.

3. Replication of the study using a national sample.

4. Replication of the study using a diagnosis other than cardiovascular disease.

6. Conduction of research designed to assess barriers to exercise prescription.

**Practice**

1. Construction of a standardized exercise assessment tool to be completed in conjunction with the medical history and physical examination of the client.


3. Documentation of the exercise prescription in the chart.

**Education**

1. Incorporation of utilization and documentation of exercise prescription into the curricula of baccalaureate and graduate schools of nursing.

2. Awareness by nurses and nurse practitioners that personal behavior impacts nursing practice and client outcomes.

These recommendations for research, practice, and education may be utilized by nurses and nurse practitioners to positively impact the physical activity
practices of individual clients in the community, the State of Mississippi, and throughout the nation.
References


Sullivan, V. (1996). Health promotion practices of nurse practitioners in Mississippi. Unpublished manuscript, Mississippi University for Women, Columbus, MS.


APPENDIX A

APPROVAL OF THE COMMITTEE ON USE OF HUMAN SUBJECTS IN EXPERIMENTATION OF MISSISSIPPI UNIVERSITY FOR WOMEN
February 26, 1997

Ms. Shannon Phillips  
c/o Graduate Program in Nursing  
Campus  

Dear Ms. Phillips:

I am pleased to inform you that the members of the Committee on Human Subjects in Experimentation have approved your proposed research with the following stipulations:

The committee suggests that you enclose a copy of the project with the consent form so the facility will be familiar with what is to be undertaken.

The consent of the facility is required prior to implementation of the study.

I wish you much success in your research.

Sincerely,

Susan Kupisch, Ph.D.  
Vice President  
for Academic Affairs

SK:wr

cc: Mr. Jim Davidson  
Dr. Mary Pat Curtis  
Dr. Rent

Where Excellence is a Tradition
APPENDIX B

LETTER REQUESTING PERMISSION TO CONDUCT STUDY
Dear ________________________________:

My name is Shannon Phillips. I am a graduate student at Mississippi University for Women in Columbus, Mississippi. I am researching the incidence of exercise prescription use among nurse practitioners in primary care in Mississippi. MUW faculty recommended I contact you regarding this endeavor.

Enclosed is a consent form which outlines data collection methods. By signing the consent form and returning it via the self-addressed, stamped envelope provided, you will be granting permission for me to review your patient charts for my study. Please note neither individual patients, facilities, nor nurse practitioners will be identified, and assistance from you or your staff in data collection will not be required. After receiving your signed consent form, I will contact you by telephone and schedule a day for data collection most convenient for you.

Please feel free to contact me at any time with questions or concerns. If you do not wish to participate in this investigation, please check the appropriate response, sign below, and return.

Sincerely,

Shannon Phillips

______________________________
____ I do not wish to participate in this study.
____ Consent form enclosed with signature.

_____________________________________
Signature of Nurse Practitioner
APPENDIX C

CONSENT TO CONDUCT STUDY
Consent to Conduct Study

Title of Research Study

Incidence of Documented Exercise Prescription in Nurse Practitioner Clients with a Diagnosis of Cardiovascular Disease

My name is Shannon Phillips. I am a registered nurse and graduate student at Mississippi University for Women. I am researching the incidence of exercise prescription use among nurse practitioners. I would like to conduct a chart review at your facility to verify nurse practitioner use of exercise teaching. Charts will be chosen at random, with the first 25 charts which identify cardiovascular disease as the primary diagnosis of the patient selected for review. Patients will be identifiable only by a researcher-assigned number, and data will be reported as a group. Individual patients, facilities, and nurse practitioners will not be identified. Information obtained during the review will remain confidential and will be limited to data relevant to the study.

I would like written permission to use your clinic for my research study. Assistance from you or your staff in data collection will not be required, and your office routine will not be affected. Thank you for your time and assistance.

I hereby give permission for my patient records to be used in this study.

___________________________  __________________________
Date  Signature of Nurse Practitioner

___________________________  __________________________
Date  Signature of Researcher
APPENDIX D

CHART REVIEW FORM FOR EXERCISE PRESCRIPTION
Chart Review Form for Exercise Prescription

I.D. Number__________________________

Age:____________________________________

Sex: _____ 1. Male _____ 2. Female

       _____ 2. Black _____ 5. Other
       _____ 3. Hispanic

Documented Exercise Mention:
   _____ 1. Yes _____ 2. No

Example of Exercise:
   Mention:___________________________________________
   ___________________________________________________
   ___________________________________________________
   ___________________________________________________
   ___________________________________________________

Documented Exercise Prescription:
   _____ 1. Yes _____ 2. No

Example of Exercise:
   Prescription:________________________________________
   ___________________________________________________
   ___________________________________________________
   ___________________________________________________
   ___________________________________________________


APPENDIX E

CHARACTERISTICS OF THE RESEARCH SAMPLE BY GROUPS
Characteristics of the Research
Sample by Groups

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*aSex: 0 = Female, 1 = Male.  
bRace: 1 = White, 2 = Black, 6 = Not reported.  
cExercise Mention: 0 = No, 1 = Yes.  
dExercise Prescription: 0 = No, 1 = Yes.

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