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Comparison Of Nurse Practitioner Exercise Prescription: Mississippi Versus Retrospective International Internet Data

Lesa J. Mathis

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COMPARISON OF NURSE PRACTITIONER EXERCISE PRESCRIPTION: MISSISSIPPI VERSUS RETROSPECTIVE INTERNATIONAL INTERNET DATA

by

LESA J. MATHIS

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

COLUMBUS, MISSISSIPPI

August 1999
Comparison of Nurse Practitioner Exercise
Prescription: Mississippi Versus
Retrospective International
Internet Data

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Abstract

Regular exercise is one of the best types of health promotion and prevention. Researchers have established that exercise decreases the risk for heart disease, hypertension, strokes, cancer, and osteoporosis. The purpose of this descriptive study was to determine the exercise prescriptive practices and perspectives of adult, family, and gerontological nurse practitioners in Mississippi compared to an international Internet study. Orem’s Self-Care Deficit Theory was the theoretical framework for this study. Surveys were sent to adult, family, and gerontological nurse practitioners in the State of Mississippi with a return envelope for response. The final convenience sample consisted of 116 surveys. The research questions were what are the exercise prescriptive practices of nurse practitioners and how do these data compare to an international Internet study? The Auburn Exercise Questionnaire Modified (Robertson, 1998) was used for data collection. Descriptive statistics including frequency, percentile, and t test were utilized for data
analysis. Analysis of the data established that while most of the nurse practitioners in both groups encouraged their patients to participate in exercise, the majority of the nurse practitioners did not prescribe exercise for their patients. In most of the mailed surveys (89.7%) and Internet surveys (94.1%) nurse practitioners participated in exercise. While the majority of both groups were familiar with Healthy People 2000 guidelines, only 20.7% of the mailed surveys and 47.2% of the Internet group were familiar with the American College of Sports Medicine guidelines. Recommendations for further research were conducting research using the questionnaire as a pretest and posttest with an educational intervention.
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Chapter I
The Research Problem

There is a high prevalence of sedentary living habits among the United States adult population (Kohl, Dunn, Marcus, & Blair, 1998). Approximately 60% of Americans lead a predominantly sedentary lifestyle, which increases the risk for illness (Kohl et al., 1998). Health habits can be changed by each individual taking responsibility for his or her health. Research has demonstrated that regular physical exercise will improve overall health and may prevent many health problems. Exercise should be promoted by health care providers through exercise prescription. Little is known about the exercise prescriptive practices of nurse practitioners. Therefore, this research will explore the exercise prescriptive practices of nurse practitioners and compare those practices to the findings of an Internet study which used the same tool.
Establishment of the Problem

Sedentary lifestyles have contributed to the risk of premature morbidity and mortality (Swinburn, Walter, Arroll, Tilyard, & Russell, 1998). The United States has a high prevalence of sedentary living habits (Kohl et al., 1998). Kohl et al. (1998) stated that 30.9% of adult Americans were sedentary with complete physical inactivity, and an equal amount were only irregularly engaged in physically activity. According to Jones and Eaton (1995), almost 60% of adult Americans were classified as sedentary, and less than 7.6% exercised at a level sufficient to provide cardiorespiratory benefits. Inactivity also contributed to depression, dyslipidemia, arthritis, and obesity which led to disability and premature death (Elrick, 1996). The United States population is not active, and such inactivity leads to health problems that have an impact similar to cigarette smoking, obesity, hypertension, and high blood cholesterol level (Burns, 1996).

A sedentary lifestyle is related to approximately one third of the deaths due to cardiovascular heart disease because millions of American adults are inactive (Francis, 1996). Coronary heart disease is the leading cause of
death for United States men and women, affecting over 13 million Americans, and accounting for 50% of deaths each year (Cox, 1997). An inactive lifestyle may cause several chronic diseases, which can lead to a prediction of early mortality (Blair, 1996). Each year heart disease, stroke, hypertension, diabetes, osteoporosis, cancer, and chronic obstructive pulmonary disease account for 70% of deaths in the United States (Elrick, 1996). Sedentary habits, which contribute to disease, include habitual inactivity, obesity, and high stress, all of which can be reduced with exercise. Such health sedentary habits are costly to the American public (Francis, 1996).

Sedentary health habits lead to a financial public health burden (Francis, 1996). Williford, Barfield, Lazenby, and Olson (1992) indicated that exercise was a cost-effective preventive measure. There are about 300,000 coronary artery bypass graft surgeries performed each year in the United States, costing more than $30,000 a procedure. Sedentary health habits have cost the United States $5.7 billion a year (Francis, 1996). The cost of health care could be reduced by decreasing the risk for chronic disease by implementation of some form of exercise.
Regular exercise is related to prevention and control of many health problems that potentiates optimal health (Williford et al., 1992). Regular exercise has been regarded as part of a healthy lifestyle for years (Francis, 1996). Adults with moderate levels of physical activity have demonstrated lower all-causes of morbidity and mortality (Blair, 1996). The use of exercise has decreased the occurrence of heart disease, hypertension, diabetes, and cancer, while increasing longevity (Lee, Hsieh, & Paffenbarger, 1995). According to Elrick (1996), exercising can "reduce blood clotting, enhance self-image, elevate mood, reduce stress, improve appearance, increase energy, give the feeling of well-being, and enforce positive life-style changes" (p. 73). Researchers determined that moderately vigorous exercise is a primary preventive measure in coronary artery disease (Cox, 1997; Lee et al., 1995). Because of the health benefits of exercise, more people need to be encouraged to participate in exercise.

One method of increasing exercise participation for the sedentary population is the use of exercise prescription by general practitioners (Swinburn et al., 1998). An exercise prescription should include assessment
and counseling on physical activity in relation to frequency, duration, intensity, and type of exercise (Williford et al., 1992).

Researchers have recommended that health care providers should be expected to promote and encourage lifestyle changes including exercise (Williford et al., 1992). Brief counseling on exercise can impact a client’s behavior, yet four out of five clients have never been told to exercise by their health care providers (Jones & Eaton, 1995). In order to increase client education on exercise, health care providers can become familiar with the objectives of Healthy People 2000 and the American College of Sports Medicine guidelines for exercise prescription (Williford et al., 1992). By following these guidelines and using exercise prescription, practitioners could endeavor to meet the objectives for the year 2000: “Increase to at least 65% the preparation of primary care providers who assess and counsel their patients regarding the frequency, duration, type, and intensity of each patient’s physical activity practices as part of a thorough evaluation and treatment program” (Williford et al., 1992, p. 633).
As primary care providers, nurse practitioners have the opportunity to provide exercise prescriptions for their clients and also need to be aware of the goal for Healthy People 2000. Robertson (1998) determined, through an international Internet survey, that 65% of nurse practitioners were not achieving these goals. However, the research was limited to only the nurse practitioner who used the Internet. More research needs to be conducted without the limitation of Internet usage in order to include a larger population of nurse practitioners.

Nurse practitioners in the primary setting have the opportunity to provide exercise prescription in order to promote health and a healthy lifestyle. This improvement in health may also decrease medical costs. However, little research has been conducted regarding exercise prescription practices of nurse practitioners. The exercise prescriptive practices of nurse practitioners in Mississippi are unknown. The purpose of this research was to explore the exercise prescriptive practices of nurse practitioners in Mississippi compared to an international Internet study using the same tool.
Significance to Nursing

Sedentary living contributes to all-cause morbidity and early mortality. The United States has approximately 25% of the adult population classified as inactive, which leads to one third of cardiovascular disease, diabetes, and colon cancer deaths (Francis, 1996). The first report on physical activity and health was prepared in 1994 including the Office of the Surgeon General, the American College of Sports Medicine, and other health related institutions. This group came together to review existing research on the role of physical activity in disease prevention and its effect on morbidity and mortality. The study found that more than 50% of youths 12 to 21 years old were physically inactive and more than 60% of American adults do not engage in regular physical activity. Physical inactivity was then recognized as a national problem by the Office of the Surgeon General. Primary care providers can assist the public in reducing all cause of morbidity and mortality by educating the public on the benefits of exercise and providing their clients with exercise prescription.

The nurse practitioner is in an excellent position to educate clients concerning health promotion, including
exercise. The mortality rate can be decreased and the financial burden of morbidity reduced by educating clients about the benefits of exercise. The nurse practitioner is included in 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 can help the public by assisting their clients in setting attainable goals for exercise and providing them with written exercise prescriptions.

Although it has been established that exercise is beneficial in health promotion and nurse practitioners have a key role in health promotion, little is known about their exercise prescriptive practices. Only two studies were identified in the literature in which nurse practitioners exercise prescriptive practices and recommendations were discussed. Further research is needed to identify the exercise prescriptive practices of nurse practitioners.

Theoretical Framework

Orem’s Self-Care Deficit Theory was utilized as the theoretical framework for this study. Orem (1985) describes her Self-Care Deficit Theory of nursing as a general theory of nursing offered as a descriptive
explanation of the human foundations of nursing and of nursing actions. This general theory is composed of three related concepts: the theory of self-care, the theory of self-care deficit, and the theory of nursing systems.

Orem (1985) defines self-care as, “an adult’s continuous contribution to his or her own continued existence, health and well-being” (p. 84). Orem also indicates that a self-care provider, self-care agent, may be needed to assist with complete or partial self-care for infants, children, or dependent adults. When an individual is unable to care for himself or herself or a dependent they encounter a self-care deficit.

Orem (1985) described self-care deficit as a relationship between the self-care demands of an individual and their ability to care for himself or herself. If the demands of self-care cannot be met by the available self-care agency or the self-care abilities of the client, a self-care deficit is noted. Orem divides self-care deficit into partial and complete. A partial self-care deficit is when a deficit is extensive or limited and a person is incapable of meeting one or several self-care demands. When there is no capability of meeting self-care demands, a complete self-care deficit is
noted. A self-care deficit of an individual may occur with the inability or lack of knowledge of care for a client's self or dependent.

Orem's Theory of Nursing Systems indicates that nursing is a human action between the nurse and the client, in which actions are determined to resolve the self-care deficit. According to Orem (1985), nursing systems stands for "all the actions and interactions of nurses and patients in nursing practice situations" (p. 148). These constructive actions have to be agreed upon by the nurse and the client. The action needs to take place in a reasonable time frame in order to be beneficial for the client's self-care deficit.

Orem's Theory of Self-Care relates to exercise prescription because clients may or may not exercise for their health. If the client does not exercise regularly, a self-care deficit is noted. A nurse practitioner may implement the theory of nursing systems by prescribing an exercise program, which is agreed upon by the client and the nurse practitioner. With the client's compliance, the self-care deficit is resolved and self-care is achieved.
Assumptions

For the purposes of this study, the following assumptions are made:

1. Nurse practitioners are aware of the benefits of exercise.

2. Clients who would benefit from exercise seek medical assistance from health care providers, including nurse practitioners.

3. Nurse practitioners are able to provide written prescriptions.

Purpose of the Study

The purpose of the study was to describe the exercise practices and exercise prescriptive practices of adult, family, and gerontological nurse practitioners in the State of Mississippi compared to an international Internet study completed by Robertson in 1998.

Statement of the Problem

There is a high incidence of sedentary lifestyles in the United States. An inactive lifestyle may lead to disease, disability, and premature death. Primary health care providers, including nurse practitioners, can help to increase physical activity through the use of exercise
prescription. However, little is known about the exercise prescriptive practices of nurse practitioner in Mississippi.

Research Questions

This study was guided by two questions:

1. What are the exercise prescriptive practices of nurse practitioners in the State of Mississippi?

2. How do the findings of exercise prescriptive practices in this study compare to the findings of an international Internet study?

Definition of Terms

The following terms are defined for the purposes of this study:

1. Nurse practitioner: Theoretical: a registered nurse in advanced practices with emphasis on primary care (Thomas, 1989). Operational: primary health care provider certified and practicing in the State of Mississippi in the areas of family, adult, and geriatric practices.

2. Exercise prescriptive practices: Theoretical: the habits of scheduling exercise for a sedentary individual. The exercise schedule has the purpose of increasing physical frequency, duration, and intensity. It may also
be used by one who is physically fit and wants to maintain a state of fitness (Thomas, 1989). Operational: written instructions and guidelines on physical activity given to a client including specific types and duration in order to promote health and prevent disease.

3. International Internet study: Theoretical: study posted on the Internet by the Worldwide Web and answered via e-mail. Operational: a study conducted internationally over the Internet (Robertson, 1998).

Conclusion

In this chapter, the benefits of physical activity and its impact on reducing all-cause morbidity and mortality were supported. However, little is known about the exercise prescriptive practices of nurse practitioners. The problem was identified as unknown exercise prescriptive practices of nurse practitioners in the State of Mississippi and how they compare to an international Internet study. Orem’s Self-Care Deficit Theory was identified and discussed as the theoretical framework. The significance of the research to nursing and definition of terms were also presented. The following chapter will present a review of literature pertinent to the research.
Chapter II
Review of the Literature

Health promotion has become a major focus of health care in recent years. Research has revealed that health promotion may help with the reduction of all-cause mortality and morbidity, cancer, and the long-term effects of chronic disease. The benefits of routine physical activity have been well researched in recent years. An emphasis has been placed on the need for exercise, yet limited research exists on the recommendations of health care providers in encouraging exercise by using prescription. The following literature review has helped determine the present research status related to exercise, nurse practitioners, and prescription for exercise.

There is evidence that inactivity is a major risk factor for heart disease and an increase in physical activity is recommended in children and adults. According to Harrell, Gansky, Bradley, and McMurray (1997), it would be very useful to determine the most common activities of young children in order to design interventions to
increase their activity levels. Harrell et al. (1997) proposed "to examine the leisure time activities of elementary school children and the intensities of these activities by gender, race, rural versus urban environment, and family socioeconomic status" (p. 246). The researchers assessed leisure time activity of third- and fourth-grade children using an adapted form of the Know Your Body Health Habits Questionnaire, which contained a list of 25 activities, ranging from very sedentary to very vigorous, that were commonly performed by elementary school children. Activities performed by the child most often were circled, and the number of times performed each activity was included. The metabolic equivalent (MET) blood pressure, total serum cholesterol, and body mass index (BMI) were measured on each child. The demographic variables of age, gender, race, and family socioeconomic status for the children of the study were measured per mailed questionnaires of the parents.

The study group was composed of a convenience sample of 2,200 third- and fourth-graders ranging in ages from 7 to 12 years of age from 18 elementary schools in the state of North Carolina. After permission was obtained from the school boards and parents, the questionnaires were
administered in the classrooms. Physiological data assessed included height, weight, and blood pressure; skin folds were obtained; and blood samples were taken for cholesterol measurement. The activities of each child were assigned to one of four categories for MET: 1 = Very low (2 METs), 2 = Low (3 METs), 3 = Moderate (5 METs), and 4 = High (8 METs). Also, activity-intensity scores were divided into three scores: the MET level of their most sedentary activity, the MET of their most vigorous activity, and the mean MET level of their three top activities. Matel-Haenszel chi-square tests were used to compare these activity-intensity scores by demographic and physiological variables.

The top leisure activities for boys and girls were homework (31%), watching television (29%), playing video games (21%), and running (20%). Playing video games (33%), playing football (32%), bicycling (31%), watching television (28%), and playing basketball (26%) were among the top leisure time physical activities for boys. Homework (39%), bicycling (31%), watching television (30%), dancing (27%), and reading (23%) were most often reported by girls. There were no obvious activity differences noted
in regard to race, rural versus urban environment, or socioeconomic status.

Leisure time physical activity, categorized by intensity level, indicated boys were significantly more physically intense than girls. Only 21% of the girls' top three leisure time activities were classified as high-active while 38% were classified as very-low active. Thirty-four percent of the boys' leisure time activities were classified as high-active while only 28% were very-low active. The top three activities mean MET level was 4.2 for girls and 4.8 for boys. Of the top three activities reported, 76% of girls reported one or more sedentary activities while only 62% of boys reported sedentary activities. In relation to high-intensity, 71% of boys reported at least one high-intensity and girls only reported 49%. The total prevalence of obesity was 26% with 27.4% in boys and 24.6% in girls. Seventy-two percent of non-obese boys and 51% of non-obese girls reported high-intensity leisure time activity. However, 40% of obese girls reported at least one high-intensity activity as one of their top three. A significant correlation was not noted with activity levels between systolic blood
pressure, diastolic blood pressure, cholesterol, or skin folds.

In conclusion, girls tended to be less active than boys. This study also revealed that there was no difference in activity level by location, socioeconomic status, or race while controlling gender. However, statistics showed that African-American boys were more active than white boys, and white girls were more active than African-American girls. Overall, these children were found to be fairly inactive. Health care promotion begins with children which helps determine active lifestyles as adults. Health care providers need to start with children in promoting healthy activities including exercise. Nurse practitioners may help this promotion with exercise prescription.

Many studies suggest high physical activity or fitness reduces premature mortality. However, genetic inheritance may make it more likely for an individual to be physically fit or more physically active (Kujala, Kaprio, Sarna, & Koskenvuo, 1998). The importance of genetics, which one has little or no control compared with things which can be modified, needs clarification. One way to distinguish between physical activity and
genetic and other familial factors is to study family members, especially twins.

In Kujala et al.'s (1998) cohort study, researchers investigated leisure physical activity and mortality with respect to familial aggregation of health habits and factors that may enable some individuals to attain higher levels of fitness. A Finnish group of twins, 7,925 healthy men and 7,977 healthy women, were ages 25 to 64 years. Subjects responded to a mailed questionnaire on physical activity habits, occupation, weight, height, alcohol use, smoking, and physician-diagnosed diseases, which included conditions known as predictors of mortality. If subjects reported exercising a minimum of six times a month with an intensity corresponding to at least vigorous walking for about 30 minutes they were classified as conditioning exercisers. Those who said they did not engage in physical activity were classified as sedentary. The other subjects were labeled as occasional exercisers.

Complete questionnaire data on leisure physical activity and risk factors were collected for 19,126 subjects (9,400 men and 7,977 women), 3,224 of whom had chronic diseases. The final study cohort included 7,925 men and 7,997 women who were healthy at baseline. The
majority of the subjects were occasional exercisers, approximately 15% of the entire study were sedentary while 55% of men and 38% of women were involved in vigorous activity.

Of the entire study cohort, 1977 through 1994, 829 men and 424 women died during the follow-up period. Eighty-two percent of those died from natural causes. The most common causes of death were coronary heart disease and cancer. No differences in all-cause mortality were observed by zygosity or twinship. The odd ratio of death in discordant twin pairs was calculated using conditional logistic regression analysis. If one twin died during the follow-up period and the other was alive, then they were classified as discordant for death. This group included 434 pairs of same-sex twins, of which 173 were also discordant for physical activity. There were 340 twin pairs who were healthy at baseline and discordant for death because of natural causes; however, among those who occasionally exercised or did conditioned exercise had reduced rates of death compared with sedentary twins.

Kujala et al. (1998) concluded that even after genetic and other familial factors were taken into account, leisure-time physical activity was associated
with reduced mortality in the sample. Kujala et al.'s (1998) study indicates how important exercise should be for everyone. Nurse practitioners can help promote this vital health benefit by prescribing exercise.

Studies have shown that regular physical activity may lower death rates. It has been indicated that physical activity may reduce mortality, but the relationship of fitness to mortality in various risk groups has not yet been established. Low fitness has not been compared with other types of mortality predictors. Blair et al. (1996) proposed to quantify the relation of cardiorespiratory fitness to cardiovascular disease (CVD) mortality and to all-cause mortality within strata of other personal characteristics that predispose to early mortality. A baseline examination was obtained including a family history, physical exam, a demographic and health habit questionnaire, anthropometry, resting EKG, blood pressure, blood chemistry, and a standardized maximal exercise test on a treadmill.

A convenience sample included 25,341 men and 7,080 women from the United States. They ranged in age from 20 to 88 years. All participants had completed preventive medical examinations which included a maximal exercise
test between December 6, 1970, and December 31, 1984. The participants had to achieve at least 85% of their age-predicted maximal heart rate during the treadmill test in order to qualify for the study. Technicians who followed a standard manual of operations administered procedures including obtaining height and weight, body mass index, blood pressure, and serum samples. Smokers were classified as those who currently smoke or quit smoking within 2 years of the exam. Cardiorespiratory fitness was primarily determined by exercise habits and was measured by the treadmill exam which was age- and sex-specific. Low fit consisted of the least fit 20% of participants in each age-sex group. The next 40% were classified as moderately fit, and the remaining 40% were high fit. The participants were followed from baseline exam to date of death or December 31, 1989. The decedents' official death certificates were obtained and the underlying cause and approximately four contributing causes of death were determined.

There were 601 male deaths during the study with 226 deaths related to CVD. Eighty-nine female deaths occurred in the study, with 21 deaths from CVD. Low fitness, cigarette smoking, elevated systolic blood pressure,
elevated serum cholesterol, and poor health status (abnormal EKG or chronic illness) were predictors of early death in men. Only low fitness and smoking were significantly related to all-cause mortality in women. Different cross-tabulations were done for mortality across fitness categories within strata of other mortality predictors for both sexes. High-fit participants with mortality predictors had a lower death rate than low-fit persons with no mortality predictors.

Blair et al. (1996) concluded that moderately-fit men and women had a lower death rate than low-fit men and women, while high-fit participants had an even lower death rate than moderately-fit participants. They also determined that a low cardiorespiratory fitness is a precursor for all-cause mortality and CVD. Their last major finding noted that protection is provided against mortality predictors of death by moderate and high levels of cardiorespiratory fitness. Clients need to be counseled on exercise in order to improve their cardiorespiratory fitness which will in turn improve their health and life span. Nurse practitioners can provide clients with exercise counseling through exercise prescription to help lower mortality and morbidity.
Many health care providers agree that physical activity enhances health. However, many are uncertain about what kinds and the intensity of physical exercise that should be prescribed. Many prescribe a regimen which includes an exercise program intense enough to produce sweating or heavy breathing 20 minutes a day three times a week. The Center for Disease Control and Prevention and the American College of Sports Medicine recommend that people should exercise moderately 30 minutes every day (Lee et al., 1995).

To provide more information on this topic, Lee et al. (1995) investigated vigorous and non-vigorous exercise and their association with premature mortality. The researchers did a cohort study to further explore this topic. The study was started when 21,582 alumni returned a questionnaire about their medical history and health practices. A total of 17,321 men who had no cardiovascular disease, cancer, or chronic pulmonary disease were eligible to participate in the study.

The subjects' physical activity and other predictors of mortality were assessed. All subjects were male, and on the average they were 46 years of age. Participants were asked questions about the time and energy they spent on
recreational activities, including climbing stairs, walking, and participating in sports. Their activities were validated by comparing energy expenditure from the questionnaire.

Let et al. (1995) were concerned with two components of total energy expenditure (TEE): (a) originating from vigorous activity requiring greater than 6 metabolic equivalent (MET’s) and (b) requiring less than 6 METs from non-vigorous activity. Each person’s energy expenditure from vigorous and nonvigorous activity was estimated separately.

Since the Harvard Alumni Office keeps rosters on deceased alumni, the researchers were able to obtain death certificates. The end point of the study was 1988. Age standardized mortality rates were compared to TEE. They were separated into five groups each of vigorous and nonvigorous energy expenditure. Lee et al. attempted to avoid observations associated between physical inactiveness and increased mortality to minimize the impact of bias.

The researchers suggested that higher levels of energy expenditure may be associated with a decrease in mortality. However, it was unclear why vigorous physical
activity was related to greater longevity and nonvigorous activity was not. Some reports attributed this to changes in cholesterol and triglycerides. Furthermore, there was an inverse relationship between exercise and coronary heart disease. It could not be determined whether the findings resulted from differences in diet, blood pressure levels, glucose tolerance, or serum lipid levels because statistical adjustment for dietary habits could not be made. However, total energy consumed as fat did not vary across activity categories. Overall, findings indicated that an increase in activity level enhances longevity. Nurse practitioners and other health care providers can help decrease the mortality of men with exercise prescriptions. A health care provider may start with a prescription of nonvigorous activities and increase the amount of exercise prescribed each visit, as tolerated, until a set goal of vigorous activity is met. Lee et al. (1995) suggested that increased vigorous activities can decrease mortality.

Exercise intensity also was investigated by Dunbar, Goris, Michielle, and Kalinski (1994). The accuracy of regulating exercise intensity by ratings of perceived exertion (RPE) was the basis for the researchers' study.
Ideally, the intensity of an exercise prescription is established by testing maximum oxygen intake (\( \dot{V}O_{2\text{max}} \)). Target heart rates were calculated with predetermined percentages of this value. However, this approach was somewhat limited. An individual may even monitor his or her own heart rate by using an electric pulse monitor. Either way may be inaccurate. The RPE method was based on the linear relation between RPE and \( \dot{V}O_2 \), during exercise. On the average there was a 1.6% statistical error when using this method. However, when one used the heart rate method there was an 8% error on the average. RPE has not been affected by cardiovascular medicines. In contrast, these medicines may alter heart rate and make it difficult to have a consistent target heart rate (Dunbar et al., 1994).

The purpose of this study was to test the validity and reproducibility of an RPE exercise prescription on the treadmill and ergometer. The subjects (\( N = 9 \)) consisted of healthy college-aged men who went through a familiarization process in which they were asked to read instructions on the Borg 15 graded-category scale for the RPE. After which, questions were answered and each subject exercised for 10 minutes on a treadmill allowing their
heart rates to go up to 150 beats/min-1. They then rested for 5 minutes and did the exercise again. This time the exercise was performed on a bicycle ergometer (Dunbar et al., 1994).

The estimation trial was on a cycle ergometer. The pedaling rate was held constant at 60 revolutions per minute. At the beginning of the trial the power output was set for 30 watts and increased by 30 watts in 2-minute intervals until the subject was exhausted, or until their peddling fell below 60 revolutions per minute. To be sure they performed with maximum effort, respiratory exchange ratio greater than 1:1 or no increase in \( \dot{V}O_2 \) with increased power output was observed.

The production trial was held on the treadmill with the Borg RPE scale displayed. Each subject was given the RPE which corresponded to 60% of his \( \dot{V}O_{2\text{max}} \). The subjects were put on the treadmill not knowing the speed or how long they had been on the machine, and they were asked to adjust the treadmill to the desired speed and were further instructed that they could change it at anytime. According to Dunbar et al. (1994), the subjects ran for 25 minutes for the purpose of testing the intermodal production accuracy of RPEs previously estimated on a cycle
ergometer. A second production trial was conducted on the cycle ergometer to examine the intramodal validity of perceptually regulated exercise, and the subject was allowed to manipulate the tension. However, pedaling rate was kept at 60 revolutions per minute, and the target RPE was the same as it was in the first production trial.

All sessions were done in an environmental chamber which was 20 °C, 42% humidity, and included a 5-minute warm up. The air which was inhaled or exhaled was analyzed and measured by a computer which provided real-time calculations of respiratory gas exchange. The subject rated his exhaustion rate by hand signals, which were verbally acknowledged by the researcher at the beginning of each minute of exercise.

Dunbar et al. (1994) concluded that the regulation of exercise by RPE was valid during treadmill production due to the \( \dot{V}O_2 \) and heart rate not differing from the target rates. Healthy individuals were able to regulate exercise intensity accurately using RPE with simple written prescriptions. Those who exercise for at least 25 minutes were able to achieve health benefits utilizing their own perceptions of energy exertion. This study strengthens the
need for exercise prescription and indicated that exercise prescription is effective in health promotion.

As indicated in the previous review, walking can provide some of the health benefits of lowering the risk of injury and sudden death (Siegel, Brackbill, & Heath, 1995). Walking has been indicated as an inexpensive and popular form of exercise. Siegel et al. (1995) proposed "to determine whether walking was an especially prevalent form of physical activity among a select demographic group with high percentages of physically inactive people when physical activity participation rates are adjusted for age, race, and sex" (p. 707). The researchers divided age groups according to years including 18 to 34, 35 to 54, 55 to 64, 65 to 74, and 75 or older, with ethnic groups which consisted of White, Black, Hispanic, and other. Siegel et al. (1995) also defined employment status as currently employed, unemployed for less than one year, or unemployed for more than one year. The researchers used thin, average, overweight, and obese as classifications for body mass. Walking for exercise was separated into two categories, regular and irregular walkers. Regular walkers exercised three or more sessions per week for 20 or more minutes per session, while irregular walkers were
described as walking fewer than three sessions per week or for less than 20 minutes per session.

Siegel et al. (1995) used a retrospective design, and data were obtained from the Behavioral Risk Factor Surveillance System in 1990 from which 45 states participated including the District of Columbia. With the exception of Alaska, Arkansas, Kansas, New Jersey, Nevada, and Wyoming, each state randomly selected a sample of noninstitutionalized adults, 18 years of age or older, who had a telephone. Telephone surveys were conducted with questions concerning “personal behaviors that increased risk for one or more of the 10 leading causes of death in the United States” (p. 707). In reference to physical activity, the participants were asked the following question: “During the past month, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercised?” (Siegel et al., 1995, p. 707). If the participant answered yes, they were allowed to describe details including frequency, duration, and distance of the two leisure-time physical activities they participated in the most.

Siegel et al. (1995) used PROC DESCRIPT from Survey Data Analysis (SUDAAN) in order to calculate prevalence
estimates and their standard errors. The percentage of respondents who reported walking for exercise were calculated by a stratum-specific percentage, as were those who reported participation in any leisure-time activity for the demographic variables of age, ethnic group, sex, employment status, and body mass. The researchers excluded homemakers, students, and retired persons from the analysis of employment. The researchers used the distribution of respondents to the 1990 Behavioral Risk Factor Surveillance System in order "to determine whether differences or similarities among group specific participation rates could be accounted for by age, race, sex" (Siegel et al., 1995, p. 708).

A total of 81,557 responded. Of these respondents, 70.3% reported having engaged in some physical activity other than their jobs (Siegel et al., 1995). The rate of leisure-time activity decreased with age, while women were less likely to participate than men. Blacks and Hispanics did not participate as often as Whites. Leisure-time activity was greater in higher-income participants than in lower-income participants, and more employed persons participated than unemployed persons. Average body mass respondents participated in leisure-time activities more
than obese respondents. According to Siegel et al. (1995), approximately 35% of the respondents were walkers. "In contrast to large demographic differences in the percentages of people who participated in any physical activity, there was relatively little variation in the percentages of those who reported walking for exercise" (p. 708). While more than half of the participants who reported walking for exercise walked on a regular basis, younger walkers were less likely to walk on a regular basis than older walkers. Siegel et al. (1995) determined "walking for exercise was more prevalent among the more sedentary income, employment status, and body mass groups, reported by between 50% and 65% of those who exercised" (Siegel et al., 1995, p. 708).

Siegel et al. (1995) concluded that about half of the people who participated in leisure-time physical activity walked, and the majority of those walkers did so on a regular basis. The researchers also indicated that "the relative prevalence of walking for exercise among the most inactive subgroups remains high even after adjustment for age, race, and sex" (Siegel et al., 1995, p. 708). The researchers also concluded that many exercise programs have dropout rates of more than 50% during the first few
months, while walking programs retained more participants for a longer period of time. The researchers proposed that walking may be more effective in promoting physical activity.

Siegel et al. (1995) determined that walking was the form of physical exercise which people participate in regularly and for a longer period of time. More people in the study were able to adapt leisure-time activities to walking because walking is inexpensive, acceptable, accessible, and can be of light- to moderate-intensity. With exercise prescription, walking may be considered a starting point in which to demonstrate consistency. Nurse practitioners could encourage walking as a first-line strategy to stimulate exercise in the client population.

Research indicates a need for exercise. Physicians’ attitudes toward exercise and exercise promotion have been determined to affect clients’ exercise practices. Williford et al. (1992) proposed “to determine physician’s attitudes and practices related to the promotion of physical activity and the development of exercise prescription” (p. 631).

A randomly selected group of 250 eligible physicians was obtained from the Board of Medical Examiners of the
State of Alabama. According to Williford et al. (1992), if physicians did not live in the state of Alabama, did not engage in direct client care, or worked in areas that would not need to recommend exercise, they were eliminated from the study.

Williford et al. (1992) employed a descriptive survey design. A panel of physicians, nurses, and exercise physiologists developed a questionnaire which determined the practices and attitudes of physicians regarding exercise promotion and prescription. The multiple-choice questions were tested on 50 subjects. The test-retest reliability rate ranged from .96 to .98. The questionnaire was mailed to the 250 eligible physicians, with self-addressed, stamped envelopes enclosed for return purposes. The final sample of 168 physicians yielded a 69% return rate. The physicians' ages ranged from 28 to 78 years with a mean age of 45.5 ± 10.8 years. The sample was 87% male and consisted primarily of internal medicine and family practice physicians. According to Williford et al. (1992), only one third of the physicians surveyed developed exercise prescriptions, and only 48% included exercise history in the initial client examination. The American College of Sports Medicine guidelines for exercise in
healthy adults were familiar to 23% of the sample. While 3% of the subjects had taken exercise and exercise prescription related classes in college, 78% of those surveyed believed there was a need for these types of courses in medical school. The researchers determined that 13% of the physicians had staff that designed exercise prescription for clients, but most referred clients for exercise. Physical therapists received the majority (68%) of the referrals, followed by other physicians (20%), exercise physiologists (9%), and nurses (3%).

Williford et al. (1992) concluded that although most physicians support the promotion of exercise, few evaluate exercise during history assessment. The researchers also indicated that physicians should determine type, frequency, intensity, and duration of exercise during the history of the client in order to develop individual exercise prescriptions. Further, the authors recommended greater emphasis be placed on physician involvement and health promotion. According to Williford et al. (1992), "possible reasons for not counseling patients may be related to lack of confidence in counseling patients, lack of insurance reimbursements, lack of education related to
the medical aspects of exercise, and lack of standard formats for assessing and prescribing exercise” (p. 633).

The author recommended physicians increase efforts to obtain exercise history and include refined exercise prescription in their practice. Physicians need to become familiar with the American College of Sports Medicine guidelines for exercise prescription.

Williford et al.’s study described physician practices of exercise prescription in Alabama. The study described the exercise prescriptive practices of physicians, which may be similar to nurse practitioners. Research focusing on nurse practitioners is needed in the State of Mississippi. Researchers have determined that information on exercise prescription is needed by health care providers.

General practitioners may be able to increase patients’ physical activities. Swinburn et al. (1998) sought to determine whether written advice from general practitioners increases physical activity among sedentary people more than verbal advice alone. According to Swinburn et al. (1998), the research question was “Does written advice from a general practitioner increase
physical activity more than verbal advice alone?" (p. 288).

The researchers selected an experimental, two-group design to assess the impact of written or verbal physical activity advice for sedentary clients from a general practitioner. Swinburn et al. defined physical activity as walking, sports, or other recreational activity. The study was performed in New Zealand over a 13-week period from fall to winter. Training sessions on assessing and prescribing physical activity were held for 37 general practitioners. Once the information was provided, the general practitioners selected clients who would be able to increase their activity over 6 months and who could benefit from increased physical activity. The general practitioner opened an envelope to randomly select the participant who received written advice and goals. Clients were excluded if they were already physically active. A total of 491 participated in the study which included 239 who received the written green prescription and 252 who only received verbal advice. A total of 456 follow-ups occurred, with 21 participants lost in the green prescription group and 14 in the verbal advice group due to missing or incorrect phone numbers or those who were
unable to be reached after five attempts. The mean age of the participants was 44 years. The green written prescription group consisted of 90 men and 128 women with 85 men and 153 women in the verbal advice group.

General practitioners used a standard questionnaire to gather baseline data on exercise levels of participants. The questionnaire studied time spent in physical activity, such as walking, sports, and leisure-time activities, over the previous 2 weeks. The questionnaire was test-retested on 41 subjects with correlation coefficients ranging from .74 to .89 and intraclass correlation ranging from .63 to .70. Statistical analyses were done with Wilcoxon rank test and repeated measures logistics. The researchers determined that 55% of the participants had medical conditions which could relate to inactivity. An average of 5.1 minutes was spent by the general practitioner giving advice about walking to 79% of the cases. In both groups the number of participants engaging in physical activity increased from 54% to 81%.

Swinburn et al. (1998) assessed five differences in the two study groups. First, the change of physical activity from baseline to follow-up showed a greater
increase in the written prescription group (p = .005). The second analysis showed the written prescription group had a higher rate of subjects who changed their amount of physical activity from baseline to follow-up (p = .02). Both groups showed a change in duration of physical activity, although the change was not found to be significant (p = .16). Self-reported participation in physical activity to maintain health or fitness increased from 36% to 68% in the written prescription group and 40% to 57% in the verbal advice group (p = .02). The retrospective self assessment showed that 93% of the written prescription group reported an increase in physical activity, and 37% in the verbal advice group (p = .10) increased their physical activity.

Although both groups showed an increase in physical activity, the written prescription group reflected a more significant increase. The researchers indicated that written advice was more effective than verbal advice alone in increasing physical activity over 6 weeks. According to Swinburn et al. (1998), clients were often more concerned about their health when seeing their general practitioner and were more receptive to the information received at that time. Swinburn et al. (1998) believed the outcomes
could be strengthened by adding a control group that would not receive physical activity advice. Overall, the authors concluded written exercise advice, used by general practitioners, could increase the activity level of sedentary clients.

Swinburn et al. (1998) addressed two types of exercise prescriptions which could be used by a physician or a nurse practitioner. Both verbal and written prescriptions were examined for their effectiveness. These data also indicated that walking was the most frequently prescribed exercise. The researchers indicate a need for written exercise prescription which could be used by nurse practitioners.

A descriptive ex post facto study was done by Phillips (1997) in order to determine the documented exercise prescription practices of nurse practitioners in clients with cardiovascular disease. Demographic data, documented exercise mention, and documented exercise promotion information were obtained by a researcher-designed review form.

Four nurse practitioners in four different geographical locations in Mississippi composed the convenience sample for the study. The four geographical
locations, Northwest Mississippi, Northeast Mississippi, Southwest Mississippi, and Southeast Mississippi, were determined by the researcher. From each location 25 records of clients were obtained and reviewed for documented evidence of either the mention of exercise or an exercise prescription. The criteria for the selected records were to have a documented diagnosis of hypertension, ischemic heart disease, previous myocardial infarction, hyperlipidemia, or atherosclerotic heart disease with no documented contraindication to exercise. The sample (N = 100) consisted of clients' records with subjects' age ranging from 35 to 65 years composed the final sample.

These data were analyzed by descriptive statistics and ANOVA. Group A included 36% male and 64% female subjects in which 12% received an exercise mention and 4% received an exercise prescription. Forty-four percent male and 56% female subjects were in group B where no subject received either documented exercise mention or exercise prescription. Group C consisted of 48% females and 44% male subjects. None of the records in this group indicated that the client received exercise mention or prescription. Group D, which consisted of 28% male and 72% female
subjects, had documentation of 20% receiving mention of exercise but no exercise prescription. Information regarding differences between the four groups was obtained through ANOVA analysis. No significant differences were noted between the groups regarding age, sex, or exercise prescription, although significant differences of documented exercise mention were found among the four groups.

In conclusion, through verbal communication with the nurse practitioners, the researcher discovered that exercise was encouraged frequently for clients even though it was not documented. Few nurse practitioners document exercise mention or prescriptions for their clients regardless of the fact that Mississippi leads the nation in the number of deaths related to cardiovascular disease. This research indicates a need to determine what is being done by nurse practitioners across the state about exercise prescription.

A descriptive study by Robertson (1998) determined the individual exercise habits and exercise prescriptive practices of adult, family, and gerontological nurse practitioners who use the Internet. The researcher designed a home page and posted it on the Internet
including information about the research and study. The home page led to the consent page and then the questionnaire. The Auburn Exercise Questionnaire, modified by the researcher, was used to obtain (a) demographic data, (b) information regarding the clinical setting and practice of the nurse practitioner, (c) most common diagnostic reason for the development of an exercise prescription, (d) exercise prescriptive practices of nurse practitioners, (e) individual exercise practices of nurse practitioners, and (f) knowledge level of practitioners regarding exercise and future goals of professional organizations.

The nonrandom convenience sample consisted of the first 34 respondents to the questionnaire. Participants selected responses to the items and submitted the consent form and questionnaire to the researcher's e-mail address. These data were analyzed using descriptive statistics. Robertson (1998) was documented that exercise was prescribed most often for weight management and that 47.1% of nurse practitioners developed individualized exercise prescriptions. Ninety-four percent of the respondents participated in regular exercise. The researcher found that the Healthy People 2000's goals of increasing the
number of health care providers who routinely develop individualized exercise prescriptions for their clients to 65% was not achieved by this sample of nurse practitioners.

Although computer technology and the Internet are international, the research by Robertson (1998) was limited to only those nurse practitioners who used the Internet. Robertson recommended a similar study be conducted without Internet usage for comparison. Mississippi, a state with many rural areas which utilize nurse practitioners as primary care providers, was an appropriate setting for research by mail surveys.

Summary

In this selective literature review, health promotion and its effect on all-cause mortality and morbidity were discussed. This researcher found a lack of exercise prescription among health care providers. It was also discovered that general practitioners have better results with written exercise prescription than verbal exercise prescription. Participants may comply with walking because this form of exercise is inexpensive and accessible. Minimal research was identified in which the
prescriptive practices of nurse practitioners in Mississippi were explicated.
Chapter III
The Method

Health care providers have increasingly become focused on health promotion in primary care settings. Nurse practitioners are one of the many primary care providers in the state of Mississippi and across the nation. Therefore, nurse practitioners need to be well versed in the benefits of physical activity for their clients. The purpose of this study was to describe the exercise prescriptive practices and individual exercise practices of nurse practitioners in Mississippi compared to the outcomes of an international Internet study.

This chapter identifies the method with which data were obtained. Adult, family, and gerontological nurse practitioners in the state of Mississippi were a sample of convenience. Data were collected by mail with the Auburn Exercise Questionnaire (Modified) (Robertson, 1998). Data were analyzed using descriptive statistics.
Design of the Study

The design of the study was a quantitative, descriptive design utilizing a survey. Exercise prescriptive practices and individual exercise habits of adult, family, and gerontological nurse practitioners were documented and compared to an international Internet study. Data were obtained using the Auburn Exercise Questionnaire (Modified) (Robertson, 1998) (see Appendix A).

Variables. The controlled variables were adult, family, and gerontological nurse practitioners in the State of Mississippi.

Setting, Population, and Design

The setting for this study was the State of Mississippi. The target population studied was family, adult, and gerontological nurse practitioners in the State of Mississippi. The sample was obtained from the Mississippi State Board of Nursing. They were chosen because exercise prescription is appropriate for the population treated by these nurse practitioners and because their individual exercise practices can be evaluated.
Methods of Data Collection

Instrumentation. Permission was obtained from the author to use the Auburn Exercise Questionnaire (Modified) (see Appendix B). This tool was developed in 1992 by a group of exercise physiologists, nurses, and physicians to determine practices and attitudes of physicians in prescribing and promoting exercise. A sample of 50 subjects resulted in a test-retest reliability from 0.95 to 0.98 for each multiple-choice question. Revisions were made by Robertson (1998) that included demographic data and information that determines individual exercise habits of nurse practitioners.

The questions were divided into six categories to facilitate comparison of the data. The categories were (a) demographic, (b) information regarding the clinical setting and practice of nurse practitioners, (c) most common diagnostic reason for the development of an exercise prescription, (d) exercise prescriptive practices of nurse practitioners, and (e) knowledge level of practitioners regarding exercise and future goals of professional organizations.
Procedure

Data collection began after obtaining approval from the Mississippi University for Women’s Committee on Use of Human Subjects in Experimentation (see Appendix C). A list of nurse practitioners was obtained from the Mississippi State Board of Nursing. The mail survey was sent to 300 family, adult, and geriatric nurse practitioners in the State of Mississippi. A cover letter was sent with the survey including information about the study and instructions for the survey (see Appendix D). After completing the questionnaire, the participant returned the survey in a self-addressed, stamped envelope. Consent was assumed upon return of the survey.

Data Analysis

Responses to the Auburn Exercise Questionnaire (Modified) were analyzed using descriptive statistics. Individual exercise habits, prescriptive practices of nurse practitioners, and the most common diagnostic reason for prescribing exercise were described by percentiles, frequencies, and category comparisons. The mean and range for each question were used for analysis of demographic data. A t test was performed based on the assumption that the two studies were independent and percentages for the
the two studies were independent and percentages for the first study were the same if the sample size was 116. A t test for unequal variances was done on those normal distributions to test the research questions.

Summary

The goal of the study was to describe the exercise prescriptive practices of nurse practitioners in the State of Mississippi and their individual exercise habits compared to an international Internet study. The target population was adult, family, and gerontological nurse practitioners in the State of Mississippi. The survey was a mailed questionnaire. Descriptive statistics were used to analyze the data.
Chapter IV
The Findings

The purpose of this study was to describe the exercise prescriptive practices and individual exercise habits of adult, family, and gerontological nurse practitioners in Mississippi as contrasted to an Internet study. In this chapter the sample will be described and data analysis will be presented. The Auburn Exercise Questionnaire (Modified) was used to obtain data. Descriptive statistics were used for data analysis.

Description of Sample
All adult, family, and gerontological nurse practitioners who completed and returned the questionnaire were utilized for the sample. The questionnaires were mailed on March 15, 1999, and data collection concluded on April 16, 1999. One hundred eighty-one mailed questionnaires were received by the researcher. A total of 116 usable questionnaires were obtained, which reflected a response rate of 64%. Respondents ranged from age 24 to 63 years with a mean age of 40.8 years. Robertson’s (1998)
Internet study was comparative with an age range from 25 to 62 years and a mean age of 49.1 years. Demographic data revealed that the respondents were predominantly Caucasian (89.7%, n = 104) and African American (10.3%, n = 12) (see Table 1).

Table 1
Demographic Characteristics of Individual Respondents

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>MOS 1999</th>
<th>IS 1998</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>104</td>
<td>89.7</td>
</tr>
<tr>
<td>African American</td>
<td>12</td>
<td>10.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Asian American</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>


Like Robertson's Internet study (94%, n = 32) female respondents comprised the majority of the MOS sample (91.4%, n = 106). Of three different areas of specialty surveyed, family nurse practitioners (85.3%, n = 99) were
predominant, followed by adult nurse practitioners (13.8%, 
\( n = 16 \)) and gerontological nurse practitioners (7.8%, 
\( n = 9 \)). The areas of specialty were similar in outcome to 
the Internet survey with 79.4% \( (n = 27) \) family, 17.6% 
\( (n = 6) \) adult, no geriatric, and 2.9% \( (n = 1) \) acute care. 
The largest percentage of nurse practitioners was employed 
at rural health clinics (25.8%, \( n = 30 \)). Hospitals 
employed 16.4% \( (n = 19) \), 10.3% \( (n = 12) \) in private 
practice, 6% \( (n = 7) \) in community or public health, 4.3% 
\( (n = 5) \) in college health, and the remaining respondents 
included a very small percentage from a variety of 
specialty areas. Robertson's study consisted of 52.9% 
\( (n = 18) \) in private practice, 29.4% \( (n = 10) \) community or 
public health, and 8.8% \( (n = 3) \) in college health. The 
majority of nurse practitioners in the mail-out survey 
(MOS) \( (78.4\%, \ n = 91) \) and the Internet survey (IS) \( (82.4\%, 
\( n = 28) \) had been in practice 5 years or less with a \( p \) 
value of .289. Forty-three percent \( (n = 21) \) of the 
respondents reported seeing an average number of 11 to 20 
clients per day (see Table 2).
Table 2

Average Number of Clients Seen Per Day by Nurse Practitioners in a Mail-out Survey and Nurse Practitioners from an Internet Survey Using the t Test

<table>
<thead>
<tr>
<th>No. of clients seen</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>16</td>
<td>7.25</td>
<td>4.163</td>
<td>-2.713</td>
<td>.007</td>
</tr>
<tr>
<td>IS</td>
<td>8</td>
<td>14.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 to 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>50</td>
<td>2.32</td>
<td>5.280</td>
<td>-4.097</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>IS</td>
<td>21</td>
<td>5.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 to 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>41</td>
<td>2.83</td>
<td>4.531</td>
<td>5.284</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>IS</td>
<td>5</td>
<td>23.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>9</td>
<td>12.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS**</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. MOS = Mail-out survey, IS = Internet survey.

*p < .01. **The IS respondents did not see > 30 clients per day; therefore, there was no comparison.
Results of Data Analysis

The study addressed the following question: What is the most common diagnosis of clients seen by nurse practitioners in Mississippi? Most commonly the respondents saw clients with a diagnosis of cardiovascular disease (44.8%, n = 52) as did the IS (see Table 3).

Table 3

Most Common Diagnoses of Clients Seen by Nurse Practitioners

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>MOS 1999</th>
<th>IS 1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>53</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>45.7</td>
<td>32.4</td>
</tr>
<tr>
<td>Upper respiratory infection</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>43.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Diabetes</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>19.8</td>
<td>17.6</td>
</tr>
<tr>
<td>Joint pain</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>6.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Ob/Gyn</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td>0.0</td>
</tr>
<tr>
<td>STD</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Fever</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Chronic disease</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Wide variety</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>

(table continues)
Table 3 (continued)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>MOS 1999</th>
<th></th>
<th>IS 1998</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Depression</td>
<td>1</td>
<td>0.9</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>Urinary tract infections</td>
<td>1</td>
<td>0.9</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Stress</td>
<td>0</td>
<td>0.0</td>
<td>8</td>
<td>23.5</td>
</tr>
<tr>
<td>Obesity</td>
<td>0</td>
<td>0.0</td>
<td>5</td>
<td>14.7</td>
</tr>
<tr>
<td>Cancer</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Note. MOS = Mail-out survey, IS = Internet survey. Respondents were given the option of choosing medical conditions other than those specified. This accounts for totals > 100%.

The researcher also addressed the following question in the study: What are the most common reasons for which nurse practitioners prescribe exercise for their clients? (see Table 4).
Table 4

**Most Common Medical Reasons Cited by Nurse Practitioners on MOS and Nurse Practitioners on IS for Prescribing Exercise Using the t Test**

<table>
<thead>
<tr>
<th>Medical reason</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>90</td>
<td>1.29</td>
<td>4.704</td>
<td>1.726</td>
<td>.086</td>
</tr>
<tr>
<td>IS</td>
<td>29</td>
<td>4.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General physical fitness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>84</td>
<td>1.38</td>
<td>4.983</td>
<td>1.794</td>
<td>.074</td>
</tr>
<tr>
<td>IS</td>
<td>22</td>
<td>5.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>56</td>
<td>2.07</td>
<td>5.341</td>
<td>1.541</td>
<td>.125</td>
</tr>
<tr>
<td>IS</td>
<td>14</td>
<td>8.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletic performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>4</td>
<td>2.9</td>
<td>2.268</td>
<td>-1.245</td>
<td>.214</td>
</tr>
<tr>
<td>IS</td>
<td>2</td>
<td>5.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* MOS = Mail-out survey. IS = Internet survey.

If respondents chose other, they were asked to specify a medical reason for prescribing exercise. Twenty-six (22.5%) of the MOS and 19 (52.9%) of the IS participants prescribed exercise for illness control.
stress, health maintenance, back pain, benign vertigo, hypertension, diabetes, hyperlipidemia, depression, improving circulation, arthritis, and unspecified.

The researcher also surveyed the exercise prescriptive practices of nurse practitioners in Mississippi. Sixty-one (52.6%) of the MOS participants included exercise history as part of the initial examination of new clients compared to 22 (64.7%) in the IS. Clients were encouraged to participate in regular exercise by 95.7% (n = 111) of the nurse practitioners in the MOS and 97.1% (n = 33) in the IS, while only 47.4% (n = 55) of the MOS participants normally developed exercise prescriptions for their clients and 47.1% (n = 16) of the IS participants. Only 33.6% (n = 39) of MOS nurse practitioners did not refer their clients to health professionals to develop exercise prescriptions or programs, while 52.6% (n = 61) refer to a physical therapist. The participants referred next to an exercise physiologist (6.9%, n = 8), followed by physician (2.6%, n = 3), nurse (2.6%, n = 3), athletic trainer (2.6%, n = 3), client educator (0.9%, n = 1), cardiac rehabilitation (0.9%, n = 1), and other (3.4%, n = 1). Walking was the type of exercise most commonly prescribed with 88.8%
(n = 103). Walking was followed by aerobics (8.6%, n = 10), swimming (5.2%, n = 6), bicycling (5.2%, n = 6), jogging (1.7%, n = 2), exercise machines (0.9%, n = 1), and do not prescribe (2.6%, n = 3).

The researcher also sought to address the following question: What are the personal exercise practices of nurse practitioners in Mississippi who responded to the mail survey? One hundred three (88.8%) nurse practitioners regarded exercise as highly important, with 12 (10.3%) feeling that exercise was somewhat important, and 1 (0.9%) regarding it as not as important as other aspects of care. Of these nurse practitioners, 89.7% (n = 104) engaged in a regular exercise program (see Table 5).

Other than walking, aerobics, bicycling, and jogging, respondents cited participating in tennis, gardening, weight training, skiing, yoga, and home gym workouts. Forty-three (37.1%) of the respondents participated in exercise at least three times per week (see Table 6).
Table 5

**Common Forms of Exercise in Which Nurse Practitioners in an MOS and Nurse Practitioners from an IS Participate Using the t Test**

<table>
<thead>
<tr>
<th>Exercise</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>87</td>
<td>1.33</td>
<td>4.855</td>
<td>1.757</td>
<td>.080</td>
</tr>
<tr>
<td>IS</td>
<td>23</td>
<td>5.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerobics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>21</td>
<td>5.52</td>
<td>4.785</td>
<td>-6.306</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>IS</td>
<td>15</td>
<td>7.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>18</td>
<td>6.44</td>
<td>4.432</td>
<td>-3.636</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>IS</td>
<td>10</td>
<td>11.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jogging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>17</td>
<td>6.82</td>
<td>2.985</td>
<td>4.552</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>IS</td>
<td>1</td>
<td>11.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* MOS = Mail-out survey. IS = Internet survey.

* *p < .001.*
Table 6

Frequency with Which Nurse Practitioners Engage in Exercising Using the t Test

<table>
<thead>
<tr>
<th>Frequency</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 time per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>11</td>
<td>10.55</td>
<td>2.862</td>
<td>1.459</td>
<td>.146</td>
</tr>
<tr>
<td>IS</td>
<td>2</td>
<td>5.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>19</td>
<td>6.11</td>
<td>4.603</td>
<td>-4.766</td>
<td>&lt; .001*</td>
</tr>
<tr>
<td>IS</td>
<td>12</td>
<td>9.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>43</td>
<td>2.697</td>
<td>4.981</td>
<td>2.468</td>
<td>.014</td>
</tr>
<tr>
<td>IS</td>
<td>9</td>
<td>12.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>12</td>
<td>9.67</td>
<td>3.376</td>
<td>-.488</td>
<td>.626</td>
</tr>
<tr>
<td>IS</td>
<td>4</td>
<td>3.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 4 times per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOS</td>
<td>19</td>
<td>6.11</td>
<td>3.901</td>
<td>.497</td>
<td>.619</td>
</tr>
<tr>
<td>IS</td>
<td>5</td>
<td>23.20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. MOS = Mail-out survey. IS = Internet survey.

*p < .001.

Twelve (10.3%) MOS respondents did not engage in any form of regular exercise. Participants were asked how long they spent during each episode of exercise. Of those who
participate in exercise, 38.8% (n = 45) spend 21 to 40 minutes per episode, followed by 41 to 60 minutes (28.4%, n = 33), 0 to 20 minutes (21.6%, n = 25), and greater than 60 minutes (0.9%, n = 1).

The researcher assessed the knowledge level of nurse practitioners regarding exercise and proposed goals from professional organizations regarding exercise parameters. Only 20.7% (n = 24) of the MOS and 47.1% (n = 16) of the IS participants were familiar with the American College of Sports Medicine guidelines for developing and maintaining physical fitness in adults. The MOS nurse practitioners indicated that 79% (n = 92) were unfamiliar with American College of Sports Medicine guidelines. In the IS, nurse practitioners reported that 52.9% (n = 18) were unfamiliar. However, a similar number of MOS (76.9%, n = 89) participants and 79.4% (n = 27) of the IS participants were familiar with the Healthy People 2000 guidelines for exercise. Seventy-eight and four-tenths percent (n = 91) of the mail respondents and 82.4% (n = 28) of the Internet respondents felt there was a need for professional schools to provide a course related to the medical aspects of exercise. Only 11.2% (n = 13) and 70.6% (n = 24) had any college level courses related to the development of
exercise prescription. Continuing education concerning how to develop an exercise prescription for different populations was available to only 22.4% (n = 26) of the MOS and 17.6% (n = 6) of the IS, while 87.9% (n = 102) of the MOS and 88.2% (n = 30) of the IS nurse practitioners would attend a workshop on exercise prescription if one was offered.

Summary

The purpose of the study was to describe the exercise prescriptive practices and individual exercise habits of nurse practitioners in Mississippi and compare the results to an international Internet study. Data were obtained using the Auburn Exercise Questionnaire (Modified). A total of 116 usable surveys were collected by mail. The surveys provided data that described the exercise prescriptive practices and individual exercise practices of nurse practitioners in the State of Mississippi. Data from an IS were compared to an MOS of nurse practitioners in Mississippi to establish similarities and differences. The data reported in Chapter IV will be analyzed in Chapter V.
Chapter V
The Outcomes

Preventive care has become a priority that can potentially decrease morbidity rates and increase longevity. Therefore, preventive care is critical to the process of living longer. The benefit of regular exercise to decrease morbidity and mortality rates for those who participate has been repeatedly documented in the research literature. Health care providers have been challenged by the Healthy People 2000 objectives to increase exercise in their clients. Individualized exercise prescriptions have been a way for primary care providers to meet this challenge. Nurse practitioners in primary care need to provide their clients with exercise prescriptions in order to promote preventive health behaviors. Nurse practitioners are in positions in which they can have a substantial influence on their client’s health through the use of an exercise prescription. The purpose of this study was to determine the exercise prescriptive practices of adult, family, and gerontological nurse practitioners in
Mississippi and how the outcomes compared to an international Internet study. The sample consisted of adult, family, and gerontological nurse practitioners in Mississippi who responded to a mailed survey. The questionnaire determined demographic data, clinical data, individual exercise habits, and exercise prescriptive practices of nurse practitioners. Descriptive statistics were used to analyze the data and then a t test was utilized to compare the results to the outcomes of an international Internet study. The outcomes of the study are presented in this chapter.

Summary of Findings

The individual exercise habits, exercise prescriptive practices, and the most common diagnoses of clients treated by nurse practitioners were studied. Data were obtained from adult, family, and gerontological nurse practitioners in Mississippi who returned the completed mail survey. A total of 116 correctly completed questionnaires were received for data analysis and then compared to an Internet study of 34 questionnaires.

With increasing acceptance for exercise, nurse practitioners have an excellent opportunity to make a positive influence on health care promotion. In this
study, a total of 89.7% nurse practitioners in Mississippi worked in areas in which they can be influential by promoting healthy behaviors for clients on a daily basis. This compared to an Internet study with 82% in health promotion positions. The majority of the mail-out survey (MOS) and Internet survey (IS) participants had been in practice 5 years or less. Both groups of study participants had 5 years or less practice and a mean age of 39 years. These data suggested that if the participants were educated about exercise and exercise prescription, the long-term benefits for their clients would be significant. Should these health care providers promote physical activity, they could have a significant impact on their clients and their quality of life, morbidity, and mortality.

The results from the study suggested that the majority for both MOS and IS are under 60 years of age. Therefore, in the MOS, only 18.1% (n = 21) of the clients seen were over 60 years of age. This is comparative to the Internet study with 11.8% (n = 4) of the clients being over the age of 60 years. This indicates that the majority of the participants are under the age of 60 and can be influenced to begin physical exercise to decrease their
morbidity and mortality rates. These results indicate that the Mississippi nurse practitioners, like the Internet participants, have the opportunity to educate their clients to begin physical activity in order to improve their quality of life. The establishment of good exercise habits should be continued throughout life to improve the client’s quality of life.

Francis (1996) indicated that cardiovascular disease was the primary cause of mortality in the United States. The majority of the nurse practitioners’ clients had cardiovascular disease in the current study and the IS. Physical inactivity is a major causative factor in approximately one third of deaths due to cardiovascular disease. Nurse practitioners in the current study would have the opportunity to educate and prescribe physical activity in order to decrease this causative factor of cardiovascular disease, therefore, decreasing the mortality and morbidity of their clients if they received education.

The primary focus of this study was to determine the incidence of exercise prescription among nurse practitioners. Swinburn et al. (1998) concluded that health care providers could promote physical activity in
their clients with written exercise prescription in addition to verbal advice. Williford et al. (1992) found that clients were more likely to begin and continue in an exercise program if they received written exercise prescriptions from their primary care provider. Williford et al. (1992) also documented that 91% of physicians encouraged exercise while only 30% actually wrote an individualized exercise prescription. In the MOS and IS, nurse practitioners reported that clients were encouraged to participate in regular exercise 97% of the time. Considering the high percentage of nurse practitioners who encouraged regular exercise, less than 50% of the nurse practitioners of both surveys wrote exercise prescriptions for their clients. This may be due to the lack of education for nurse practitioners on exercise prescription. If exercise prescriptions were provided by the nurse practitioners, the reason was usually for weight management and physical fitness. The majority of the nurse practitioners in the current study and in Robertson’s study referred clients to other health professionals for exercise prescriptions and referred primarily to physical therapists. A third of Mississippi survey participants did not refer clients for exercise prescriptions or programs,
while all of the Internet participants referred for some type of exercise prescription. Mississippi nurse practitioners may not have referred for exercise prescriptions because of client financial stressors or availability of programs. Siegel et al. (1995) determined that walking was the most accessible and acceptable exercise activity. Among those prescribing exercise, the majority prescribed walking for their clients in both the mail group and the Internet group. Nurse practitioners have an opportunity to provide excellent preventive care with the use of exercise prescription; however, the number of exercise prescriptions written in this study and the Internet study was low. Nurse practitioners should become more cognizant of the need for exercise prescription in order to decrease the morbidity and mortality rates among their clients.

Nurse practitioners should also be positive role models by participating in physical activity. The researcher established that the majority of both survey participants were involved in some form of exercise. Only 5.9% (n = 2) of the Internet participants did not exercise, while 10.3% (n = 11) of the mail participants did not exercise. Walking was the exercise of choice for
both the MOS and the IS participants. There was a significant difference in the number of times per week the MOS and the IS participants exercised. The MOS group achieved the American College of Sports Medicine guidelines to exercise three times per week while the IS did not. The reason for this may have been that the IS group preferred to use the bicycle much more than the MOS group. The opportunity to bicycle for the respondents may not have been as available because of changes in weather, lighting, or traffic. Data indicate that nurse practitioners are physically active, therefore, are able to encourage and educate their clients on exercise prescription habits and benefits.

The physical activity goals of Healthy People 2000 are that 20% of the adult population will engage in a level of physical activity that will maintain cardiovascular fitness, a minimum of 22% of the elderly population will engage in leisure-time physical activity, 30% of the population will engage in daily physical activity, and that no more than 15% of people age 6 years and older will be living a sedentary lifestyle (Francis, 1996). The American College of Sports Medicine provides guidelines which are more specific and recommends 20- to
30-minute periods of exercise three to five times per week. According to the responses to the Auburn Exercise Questionnaire (Modified), the nurse practitioners in both studies were familiar with Healthy People 2000 objectives. A surprising outcome was that only 20.7% of the mail respondents and 47.1% of the Internet respondents were familiar with the American College of Sports Medicine Guidelines for developing and maintaining physical fitness in adults. A significant difference was noted between the two groups' college level courses taken for development of exercise knowledge. Only 11.2% of the mail respondents had taken a course, as opposed to 70.6% of the Internet respondents who had taken such a course. Despite such differences, both groups (mail 78.4%, Internet 82.4%) believed that there was a need for courses related to the medical aspect of exercise in professional schools. Since continuing education was not available to most of the respondents, a majority of the participants were interested in attending workshops on exercise prescription. The study outcomes demonstrate a need for education about the American College of Sports Medicine guidelines, Healthy People 2000 objectives, and exercise prescription for clients.
The current study and Robertson’s study had many similarities even though the sample sizes were different. The mail survey had a better response rate with 116 usable surveys compared to the Internet with 34 usable surveys. The Internet study demonstrated some diversity with 32 Caucasian, one Hispanic, and one Asian-American respondents. The mail survey only represented two ethnic groups of Caucasian (n = 104) and African-American (n = 12). Despite the lack of ethnic diversity, the responses to the survey were very similar.

Implications for Nursing

Nurse practitioners play a vital role in health promotion. They not only assess, diagnose, and treat clients’ illnesses, but they also have a responsibility to provide primary preventive care for their clients. The importance of the nurse practitioner in the education of clients concerning regular preventive habits for decreasing the impact on aging and increasing their quality of life is critical. This research indicated that many nurse practitioners did not provide written exercise prescriptions for their clients even when they indicated exercise was important for their health. This research further established that nurse practitioners need to be
educated on exercise prescription and the importance of providing exercise prescriptions for their clients.

The researcher also discovered that many nurse practitioners did not receive any education on exercise prescription while they were in college and were not aware of any continuing education classes on the subject. The information that was available in the literature was from medical journals. This study indicated a need for more nursing research, information, and education for nurse practitioners dealing with exercise prescription. As a result of the study outcomes, this researcher recommends the following:

1. All nurse practitioner programs should teach exercise prescription to their students.

2. Continuing education for nurse practitioners should include the positive benefits for the client using exercise, including directions to write exercise prescriptions.

3. Publishing the outcomes of the study in nurse practitioners journals in order to increase knowledge about exercise and exercise prescription.

By increasing the knowledge level and awareness of nurse practitioners about exercise prescription, education
of clients could improve the health of clients, thereby decreasing overall medical costs in Mississippi and the United States.

Orem's Theory of Self-Care Deficit provided the appropriate theoretical structure for the study. Orem stressed the importance of self-care. Clients go to a nurse practitioner for preventive care and are not aware of the benefits of exercise. The nurse practitioner and the client identify this as a self-care deficit. Nurse practitioners can educate these clients on exercise and provide exercise prescriptions as supportive education in order to help their clients achieve self-care.

This research identified the exercise prescriptive practices of nurse practitioners in the state of Mississippi. The outcomes indicated that nurse practitioners supported exercise and participated in exercise personally. Further research should be conducted on the outcomes for clients who participate in exercise as a result of an exercise prescription. Also, further research should be conducted on why nurse practitioners do not write exercise prescriptions even though exercise is known to improve a client's quality of life.
Recommendations

Based on the findings of this study, the following recommendations are made:

1. Replication of the study using comparisons of nurse practitioners to physicians.

2. Replication of the study with only pediatric nurse practitioners in order to study the exercise prescriptive practices for children and adolescents.

3. Conduction of longitudinal research using children who have received exercise prescriptions measuring their compliance.

4. Conduction of research using the questionnaire as both a pretest and posttest, with an educational intervention in order to determine the impact of education on exercise prescription.

Summary

Nurse practitioners, as health care providers, have an important role in primary care prevention. Nurse practitioners are in a position to be positive role models for their clients and their communities. This research indicates that the majority of nurse practitioners exercise on a regular basis, which places them in an even better position to educate their clients on exercise
prescription. As evidenced by the current study, nurse practitioners feel that exercise is an important part of primary health care and are willing to learn more about exercise and exercise prescription. Nurse practitioners using individualized exercise prescriptions for their clients will facilitate primary care prevention and help decrease the cost of health care in Mississippi and the nation.
References


APPENDIX A

AUBURN EXERCISE QUESTIONNAIRE (MODIFIED)
Auburn Exercise Questionnaire (Modified)

Please read each question and put a check (✓) on the desired response(s):

1. Age (years): __________

2. Gender
   ___ Female
   ___ Male

3. Ethnicity
   ___ African American
   ___ Asian American
   ___ Caucasian
   ___ Hispanic
   ___ Mixed
   ___ Other (please specify): ____________________________

4. Are you a citizen of the United States?
   ___ Yes
   ___ No (please specify country): _________________________

5. Nurse practitioner specialty
   ___ Family
   ___ Adult
   ___ Geriatric

6. Type of setting where you are employed as an NP
   ____________________________

7. Number of years have in practice as an NP
   ___ 0 to 5 years
   ___ 6 to 10 years
   ___ 11 to 15 years
   ___ Over 15 years
8. Average number of patients seen per day
   ____ 0 to 10
   ____ 11 to 20
   ____ 21 to 30
   ____ Over 30

9. Average age of patients seen
   ____ 0 to 10 years
   ____ 11 to 20 years
   ____ 21 to 30 years
   ____ 31 to 40 years
   ____ 41 to 50 years
   ____ 51 to 60 years
   ____ Over 60

10. Most common diagnosis of patients seen

11. Is exercise history a part of the initial examination
    of new patients?
    ____ Yes
    ____ No

12. Do you encourage your patients to participate in
    regular exercise?
    ____ Yes
    ____ No

13. Do you normally develop exercise prescriptions for
    patients?
    ____ Yes
    ____ No

14. Does another member of your organization develop
    exercise prescriptions?
    ____ Yes
    ____ No

15. Do you refer patients to other health professionals
    to develop exercise prescriptions/programs?
    ____ Physician
    ____ Nurse
    ____ Physical therapist
    ____ Exercise physiologist
    ____ Other (please list or explain): ___________________
16. Are patients referred to you to develop an exercise prescription?
   ___ Yes
   ___ No

17. If you prescribe exercise, is it for (check all that apply):
   ___ Rehabilitation
   ___ Athletic performance
   ___ General physical fitness
   ___ Weight management
   ___ Other (please specify):

18. If you prescribe exercise for rehabilitation is it for
   ___ Cardiopulmonary rehabilitation
   ___ Orthopedic rehabilitation
   ___ Weight management
   ___ Other (please specify):

19. When you need additional advice concerning exercise, what person do you normally consult
   ___ Physician
   ___ Physical therapist
   ___ Nurse
   ___ Exercise physiologist
   ___ Other (please specify):

20. What mode of exercise do you generally prescribe to increase cardiovascular fitness? Please list.

21. Do you exercise yourself
   ___ Yes
   ___ No

22. What kind of exercise do you engage in?
   ___ Walking
   ___ Aerobics
   ___ Jogging
   ___ Bicycling
   ___ Other (please specify):
23. How often do you engage in exercise?
   ___ Once per week
   ___ Twice per week
   ___ Three times per week
   ___ Four times per week
   ___ Over four times per week (please specify):

24. How long do you exercise during each episode of exercise?
   ___ 0 - 20 minutes
   ___ 21 - 40 minutes
   ___ 41 - 60 minutes
   ___ Over 60 minutes

25. Do you feel exercise is
   ___ Not important at all
   ___ Not as important as other aspects of care
   ___ Somewhat important
   ___ Highly important

26. Are you familiar with the American College of Sports Medicine Guidelines for developing and maintaining physical fitness in adults?
   ___ Yes
   ___ No

27. Are you familiar with the Healthy People 2000 guidelines for exercise?
   ___ Yes
   ___ No

28. Did you take any college level courses related to the development of exercise prescriptions?
   ___ Yes
   ___ No

29. In your opinion, is there a need in professional schools for a course related to the medical aspects of exercise?
   ___ Yes
   ___ No
30. Is continuing education available concerning how to develop an exercise prescription for different populations?
   ____ Yes
   ____ No

31. Would you attend a workshop on exercise prescription if one was offered?
   ____ Yes
   ____ No

Additional Comments:
APPENDIX B

PERMISSION TO USE TOOL
Dear Mrs. Robertson,

I am currently in the Master of Science in Nursing Program at Mississippi University for Women. I am planning on doing a research study on the exercise prescriptive practices of nurse practitioners in the State of Mississippi through a mail survey. I would like your permission to use the modified version of The Auburn Exercise Questionnaire. I would appreciate your approval. Please write me with any questions you may have and your response.

Thank you for your time and consideration.

Sincerely,

Lesa J. Mathis, RN, BSN
November 23, 1998

Lesa Mathis
31 CR 140
Oxford, MS 38655

Dear Lesa,

You have my permission to use the modified version of The Auburn Exercise Questionnaire with revisions as necessary to fit your study. Please meet with your statistician early and let him or her look over the questionnaire and make sure it will answer your research questions. My research questions had to be revised after meeting with the statistician because the questionnaire would not have given me the necessary information. Good luck in your study! Keep me informed of the progression of the study and the results. I have found in my practice that exercise among clients is the one area that is most often neglected. We are a society of pills instead of self help techniques!

Sincerely,

Cindy L. Robertson, RN, MSN, CFNP
APPENDIX C

APPROVAL OF COMMITTEE ON USE OF HUMAN SUBJECTS IN EXPERIMENTATION OF MISSISSIPPI UNIVERSITY FOR WOMEN
March 1, 1999

Ms. Lesa Mathis  
c/o Graduate Program in Nursing  
Campus

Dear Ms. Mathis:

I am pleased to inform you that the members of the Committee on Human Subjects in Experimentation have approved your proposed research upon the condition that all data should be kept confidential and placed under lock and key.

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. Patsy Smyth

Where Excellence is a Tradition
APPENDIX D

COVER LETTER TO PARTICIPANT
Dear Nurse Practitioner,

I am a graduate nursing student at Mississippi University for Women. You are being asked to participate in a study to determine the exercise prescription practices of nurse practitioners in the State of Mississippi. The results of this survey will be compared an international Internet study.

Please complete the questionnaire that is enclosed. It includes questions about demographic data, exercise, and prescriptive practices regarding exercise. The questionnaire will take approximately 7 minutes to complete. After completion of the questionnaire, please return in the self-addressed, stamped envelop provided.

The information obtained through this study will be kept confidential. Your name is not requested and will not be revealed at any time during this study. All findings of the study will be published as group data for scientific purposes, and at not time will your identity be revealed.

There will be no cost to the participant, nor will the participant receive payment.

If you have any questions about the research, please contact Lesa Mathis at the above address or phone number.

If you would like the results of this study, you may add a name and address in the comment section of the survey, or e-mail me at lesa@ispchannel.com.

Thank you very much for your time and consideration!

Sincerely,

Lesa Mathis, RN, BSN

Enc: Survey