EXERCISE STAGES OF CHANGE AMONG HISPANICS

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN THE GRADUATE SCHOOL OF THE TEXAS WOMAN'S
UNIVERSITY

COLLEGE OF HEALTH SCIENCES

BY

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DECEMBER 1994

COLLEGE OF HEALTH SCIENCES
TEXAS WOMAN'S UNIVERSITY
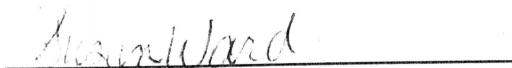DENTON, TEXAS

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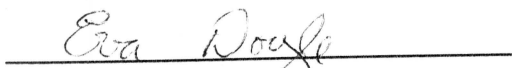Date

To the Dean for Graduate Studies and Research:

I am submitting herewith a dissertation written by Beverly Triana-Tremain entitled "Exercise Stages of Change Among Hispanics." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Health Studies.

Dr. Judith Baker
Major Professor

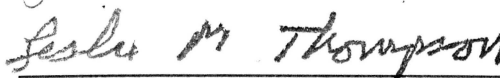We have read this dissertation
and recommend its acceptance:

Department Chairman

Accepted

Dean, College of Health
Sciences

Associate Vice President for
Research and Dean of the Graduate
School

DEDICATION

To Jack, your unequivocal faith in me for the last five years has been my strength. I know I can not fully understand the sacrifices you have had to make. However, I do know that I have an idea of its magnitude. Many times when things seemed just too hard to endure, you always seemed to be there to pick me up. You always understood the importance of this work because it meant so much to me. I never had to explain my reasons for taking this challenge. Thank you for letting me be myself, but never letting me get away with anything less than what you knew I could be.

Persistence

Nothing in the World
can take the place of persistence
Talent will not;
nothing is more common than
unsuccessful men with talent.
Genius will not;
the world is full of educated derelicts.
Persistence and determination
alone are omnipotent.
The slogan "Press On" has solved
and always will solve
the problems of the human race.

-Calvin Coolidge-

ACKNOWLEDGEMENT

My sincere gratitude goes to Dr. Judy Baker, the chair of my doctoral disseration committee. I have grown a tremendous amount under your guidance and mentoring. Not only did I enjoy you as a superb teacher, but as a good friend. I will miss being under your guidance. I also wish to thank the other members of my committee, Dr. William Cissell, Dr. Susan Ward, and Dr. Eva Doyle. Each of you has earned my respect and appreciation. Thank you for showing great excitement and ethusiasm for my project in the beginning and throughout its completion. For statitistical guidance, I thank Dr. Barbara Gench. Working with you throughout the years has been a delight.

I owe a special debt of gratiude to Ms. Olga Stecker, Ms. Becky Lyng, and Ms. Linda Noonen. Although they acted as my interpreters during this long and tedious project, we all became good friends. Every step of the way they displayed an excitement and a passion that they were taking part in something that was definately worthwhile.

For those individuals and agency personnel that opened their doors to me and allowed me to interrupt their normal daily routine, I have a special appreciation and respect. All showed an understanding that my project had worth for the Hispanic population. They acted as my "gatekeepers," allowing me to complete my requirements for this project. Special appreciation goes to

ABSTRACT

COMPLETED RESEARCH IN HEALTH SCIENCES
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Triana-Tremain, B. F. <u>Exercise stages of change among Hispanics</u>. PhD in
   Health Studies, 1994, 152 pp. (J. Baker).

The purpose of the study was to determine the effectiveness of an intervention

based on the Exercise Stages of Change model in increasing the self-reported

physical activity and exercise self-efficacy of currently sedentary Hispanics who

are interested in starting an exercise program. Data were collected on 57

Hispanics who were assigned to either the tailored group ($\underline{n} = 27$) or the

standard group ($\underline{n} = 28$). The tailored group was given an intervention based

largely on principles of behavior change according to one's level of readiness,

as assessed by the Exercise Stages of Change instrument. The standard group

was given an intervention that was based upon the American College of Sports

Medicine traditional standards. Data were collected on 11 variables, which

included age, gender, ethnicity, education level, acculturation status, pre and

posttest exercise stage of change scores, pre and posttest exercise self-efficacy

scores, and pre and posttest total self-efficacy scores. A comparison of the

exercise stage of change scores for both the tailored and standard groups was

done by the Stuart-Maxwell Test for Correlated Proportions. This test of

proportions indicated that the tailored intervention subjects were significantly more active after the intervention than the standard intervention subjects. For the tailored group, 97% ($\underline{n}$ = 28) of those reporting no exercise prior to the intervention became active during the intervention. Approximately 68% ($\underline{n}$ = 19) of those in the standard treatment became more active during the intervention. The observed effect was significant at $\underline{p} < .001$, tested at the alpha 2-tailed level of .05. An independent t-test on exercise self-efficacy scores indicated that the tailored groups had a significantly higher posttest self-efficacy score than the standard groups. A significant difference was found in the tailored ($\underline{M}$ = 68.07) and standard ($\underline{M}$ = 55.28) groups with respect to posttest Exercise Self-Efficacy scores, $\underline{t}(54) = 2.84$, $\underline{p} = .006$.

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CHAPTER I

INTRODUCTION

Numerous studies document that sedentary lifestyles play a major role in the development of chronic diseases, such as cancer, heart disease, diabetes, stroke, and high blood pressure. However, this knowledge does not explain why less than 10% of the U.S. population regularly participates in a program of physical activity vigorous enough to improve cardiorespiratory fitness (U.S. Department of Health and Human Services, 1990). As a health professional or lay individual, one may be aware of the etiology of chronic diseases, however, knowledge is not always followed by appropriate behavior in the intended population. In future research and interventions, health professionals must be concerned with the cognitive and emotional processes that may impact a person's decision to adopt a healthy behavior. Simply knowing and understanding the physiological processes that occur through a continuous exercise program is not sufficient. There must be a concerted effort at assisting the individual with thinking about behavior change, clarifying attitudes and beliefs, getting started, maintaining a program, and anticipating and overcoming problems and barriers (Blair, 1991).

Historically, the emphasis has been placed on exercise programs that were very structured, regimented, and void of any creative movement. This has

been the gold standard of exercise programs for nearly thirty years. However, Blair ("Exercising Options," 1993) suggested that "we made a mistake by insisting early on that it must be sustained aerobic activity" (p. 12A). The new guidelines by the American College of Sports Medicine (ACSM) (1992) indicate that "30 minutes or more of moderate physical activity, such as a brisk walk, gardening or taking the stairs instead of an elevator, at least four days a week" (p. 12A) is sufficient to manifest health gains. The activity can be done at one time or intermittently. This is not to suggest that the traditional exercise guidelines of at least 20 minutes of continuous aerobic activity is obsolete. However, there must be an alternative or staged approach that caters to the needs and fitness levels of the presently sedentary population. What one must keep in mind is that not all individuals are pursuing the same outcome. The individual that participates in intense activity for Olympic competition or athletic prowess is psychologically, physiologically, and emotionally different from the person who wants to lengthen his or her lifespan, prevent disease, and engage in moderate, enjoyable activities for life. For the latter, it is imperative that strategies used to change exercise behavior be appropriate to their level of readiness.

Justification of the Problem

Health educators must design, plan, and implement original behavior change programs specifically for minority populations. There are few published studies that attempt to discern the effect of cardiovascular disease interventions on the health of minorities (Baranowski, 1992). Statistics indicate that by the year 2020 there will be over 47 million Hispanics in the U.S., representing over 15% of the total population. Hispanics will be the nation's largest minority group (Marin & Marin, 1991). Also, inactivity has recently been deemed a fourth primary risk factor for heart disease by the American Heart Association (American Heart Association, 1992).

Statement of the Problem

Before true behavior change can occur, the health educator must be sensitive to the various levels of readiness that an individual possesses. Health educators must have theoretical frameworks that suggest appropriate strategies for individuals beginning a behavior change program. Therefore, the problem of this study was to investigate the effectiveness of an intervention based on the stage of change model in increasing the adoption of physical activity among Hispanics.

Purpose of the study

The purpose of the study was to determine the effectiveness of an intervention based on the Exercise Stages of Change model in increasing the self-reported physical activity and exercise self-efficacy of currently sedentary Hispanics who are interested in starting an exercise program. Only those subjects identified as contemplators were used in the data analysis.

Theoretical Framework

The theoretical framework for this study was Prochaska's Stage of Change Model. Prochaska's Stage of Change Model suggests that individuals are more successful at behavior change if it is considered a process and not the culmination of a single action. Prochaska (1993) indicated that "health promotion programs have typically been dominated by an action-oriented approach to behavior change...people are expected to change from overeaters to undereaters, smokers to nonsmokers, couch potatoes to exercises, and worriers to meditators" (p. 251). In Prochaska's approach, the individual's stage of readiness for behavior change is emphasized. For example, the usual approach is to always assume that an individual is cognitively, physically, and emotionally ready to begin a traditional exercise program. Rarely does counseling take into consideration that the individual might have an extreme dislike for exercise.

Under the Stages of Change model, individuals are classified into one of the six phases of readiness to adopt a new behavior: precontemplation, contemplation, preparation, action, maintenance, and termination.

The precontemplation stage exists for individuals who have no serious intentions for changing the behavior and are usually very defensive about encouragement for change. They are not ready for action, due to their perception that changing behavior is more risky than maintaining the same behavior, even when that behavior is known to be a health risk. The contemplators are those individuals who are seriously looking at changing a lifestyle behavior, but they are not sure of how to proceed. Many professionals often hear the contemplator remarking how one day he or she will join the program and change their lifestyle. Many individuals stay in this stage for years, always thinking about the problem for fear of painful action. The preparation stage involves seeking advice, gaining knowledge, or taking other small action steps to support a change of behavior. Societal pressures tend to force individuals into the action stage. A common problem is that people are not prepared for the sacrifices and consequences of this stage. They may have not worked through many of the emotional, physical, or environmental barriers that hinder adoption of a behavior. The maintenance stage involves keeping the behavior consistent. However, it is at this stage that the dropout rate is the highest. To ensure a smooth transition from maintenance to termination,

individuals should be involved in creating personal strategies. Those at the termination stage have clearly adopted the behavior and have incorporated it into their lifestyle. One characteristic of this stage is increased self-efficacy. During the processes, the participant has won small battles over resistance to change. Therefore, with each step, behavior change becomes easier, more desirable, and less painful.

The Stage of Change Model may be time-consuming and frustrating to health professionals who have become complacent in prescribing exercise on command. What is required is a different approach that requires patience, follow-up, and understanding. In a recent smoking cessation study by Prochaska, DiClemente, and Norcross (1992), it was determined that if individuals progress from one stage to the next following an intervention, they double their chances of taking action to change a health behavior during the next six months. Prochaska found that, of the precontemplators who were still in this stage at one month follow-up, only 3% took action by 6 months. For the precontemplators who progressed to contemplation at one month, 7% took action by 6 months. Approximately 41% of the contemplators who progressed to the preparation stage were not smoking after six months. Conclusions drawn were that "treatment programs designed to help people progress just one stage in a month can double the chances of participants taking action on their own in the near future" (p. 254). Longitudinal research must be conducted on

a variety of populations in different stages before an understanding about the value of this model for health educators will be attained.

Assumptions

The following assumption was made for the purpose of this study:

1. A nonbilingual researcher will have the ability to communicate effectively with Spanish and/or English speaking subjects with the assistance of a qualified interpreter.

Hypotheses

The following null hypotheses were tested at the .05 level of significance:

1. There is no difference in exercise self-efficacy between subjects in the tailored-treatment intervention (tailored) and the standard-treatment intervention (standard) on posttest.

2. There is no difference in proportion of subjects in the preparation stage between the standard group and the tailored group at posttest.

Research Question

The following research question was created for this study:

1. Is the amount of progress in an exercise program a function of the type of treatment at the start of treatment?

Definition of Terms

The following terms were used in this study:

1. <u>Stages of Change</u>. The stages of change model is a framework and maintenance of behavior. Individuals who engage in a new behavior move in an orderly progression through stages. The intervention used at each stage is appropriate to the readiness of the individual to make a behavior change (Prochaska & DiClemente, 1983).

2. <u>Precontemplation stage</u>. Individuals in this stage do not intend to change their high-risk behavior in the foreseeable future.

3. <u>Contemplation stage</u>. Individuals in contemplation seriously intend to change their behavior within the next six months.

4. <u>Preparation stage</u>. Individuals in the preparation stage intend to take action in the near future, usually the next month. They have a plan of action and have made small behavior changes.

5. <u>Action stage</u>. Observable behavior changes are noticed in this stage and the occurrence of the targeted behavior is absent.

6. <u>Maintenance stage</u>. The maintenance stage is a period of continuing change and challenge for the individual and where relapse is more likely to occur.

7. <u>Termination stage</u>. There is no temptation to engage in the prior behavior and 100% self-efficacy is achieved.

8. <u>Exercise Self-Efficacy</u>. The confidence one has with his or her ability to persist with exercising in various situations (Marcus, Selby, Niaura, & Rossi, 1992).

9. <u>Physical Activity</u>. "Any bodily movement produced by skeletal muscles that results in energy expenditure" (Meyers, 1992, p. 8).

10. <u>Exercise</u>. "Planned, structured, or repetitive bodily movement done to improve or maintain one or more components of physical fitness" (Meyers, 1992, p. 8).

11. <u>Hispanic</u>. Hispanics are defined as those individuals who reside in the U.S. and were born in or trace the heritage of their families to one of the Spanish-speaking Latin American nations or to Spain (Marin & Marin, 1991) or "a person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race" (<u>Federal Register</u>, 1978, p. 19269).

Limitations

This study was subject to the following limitations:

1. The accuracy of subjects in reporting personal data on instruments utilized in the study will be a limitation.

2. A sample of convenience was used. Therefore, the results of the study were only generalized to the participants of this study.

Delimitations

The following variables were controlled:

1. Individuals used as subjects completed a Major Risk Factors for Coronary Heart Disease Questionnaire (American College of Sports Medicine, 1992). Those individuals having two or more risk factors were instructed to obtain physician consent prior to participating in the study.

2. Only individuals ages 18 to 65 years of age were included as subjects.

3. Only individuals in the contemplation stage of readiness for exercise were included as subjects.

Summary

Recent research indicates that individuals need not engage in intensive, regimented, and continuous exercise in order to prevent disease, prolong life, and improve general well-being. A new step-wise movement along a

continuum of change is being suggested as a method to promote a more active lifestyle among sedentary individuals. Simply by assessing an individual's stage of readiness, the health practitioner can suggest more appropriate activities that offer a kinder, gentler approach to health behavior change. This model not only relies on a tailored approach to health behavior change, but it provides a heightened sensitivity that is so needed when counseling those individuals with different ethnic, linguistic, and cultural backgrounds.

CHAPTER II

REVIEW OF THE LITERATURE

The review of literature in this study is presented in four sections. The first section highlights literature on recognizing the various methods used when identifying Hispanic Americans according to ethnicity. The second section emphasizes literature on cardiovascular disease and Hispanics. This review is followed by a section that compares and contrasts the roles of physical activity and physical fitness and risk of cardiovascular disease. The last section reviews literature regarding the stage of change model and self-efficacy theory as they relate to exercise behavior.

The changing demographics in the U.S. are indicative of a foreseeable need for more literature concerning the health status and needs of the Hispanic people. Kumanyika and Golden (1991) stated that "we do not have it right, theoretically, conceptually, or practically, for all groups and for all times" (p. 50). The need for qualitative and quantitative research that focuses on the improvement of design, implementation, and evaluation of programs for minorities is greatly warranted.

The Use of Race and Ethnicity in Public Health Surveillance

Attempts have not been successful at standardizing the system during data collection, analysis, and dissemination of health information. In 1993, the Centers for Disease Control (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR) dedicated discussion at a workshop to the following objectives: (a) describe how race and ethnicity are currently being measured; (b) assess the epidemiologic basis of the use of race and ethnicity for planning, implementation, and evaluation; and (c) initiate the development of improved measures of identifying race or ethnicity (Hahn & Stroup, 1994; McKenney & Bennett, 1994; Williams, Lavizzo-Mourney, & Warren, 1994).

The following reviews of literature indicate the necessary research that must be initiated before investigators can appropriately collect data concerning ethnicity and race. The reviews document the findings of those researchers who participated in the CDC/ATSDR workshop.

Hahn and Stroup (1994) identified the lack of scientific consensus on race and ethnicity as a barrier to effective prevention measures. Differences in terminology, data collection procedures, perceptions of group identity, and changing demographics of the U.S. create logistical problems. The researchers proposed criteria to be used through surveillance of any kind. When applied to race and ethnicity, these criteria created what the researchers termed, "self-perceived membership," not biological characteristics. These criteria were

identified as conceptual validity, measurability and measurement validity, exclusivity and exhaustiveness, meaningfulness to respondents, reliability, consistency, and flexibility. These terms are explained as follows.

Conceptual validity indicates that the categories to be researched have observable phenomenon. For example, the recent Atlas of U.S. Cancer among Nonwhites: 1950-1980 combines data for all nonwhite individuals (National Cancer Institute, 1991). Hahn and Stroup suggested that this "generic categorization limits the use of the atlas for etiologic research and for the design and implementation of targeted intervention programs" (p. 11). Measurability and measurement validity ensure that the instruments used are sensitive and have positive predictive value. That is, the instruments not only measure biological categories, but perceptions of these categories. Before this can occur, researchers must have a good understanding of the concepts, language, and cultural etiquette of the intended population. Exclusivity and exhaustiveness mean that categories are well defined and include all members of a population and are mutually exclusive, as it contains only members of that group. Prerequisite to any research project is that respondents understand and can interpret questions asked of them. For example, 40% of self-identified Hispanics did not respond to the race question on the 1990 census. The researchers indicated that this suggests that concepts of race and ethnicity are meaningless to respondents. Also, reliability can be a major problem in

classification of vital records. Of infants classified as white at birth, 1.2% had a different race at death, 4.3% of black infants at birth had a different race at death, and 53.2% of other races had a different race at death. According to the researchers, consistency and flexibility are two other major criteria that need to be met for productive surveillance. Consistency is the repeated use of terminology in the same way. For example, the number of American Indians have been underestimated by as much as 35% in recent census because of demographics. Public surveillance methods must also have flexibility. This is evident in how African Americans have been described in recent decades, that is "colored," "Negro," or "black."

From the ideas presented, several challenges were made. First, public health professionals must consider popular categories of race and ethnicity, although they are not scientifically derived. These data indicate important information about health status. Second, the authors claimed that race in public health surveillance is not a "biological characteristic, but rather a self-perception for which phenotypic characteristics may be one among many criteria" (Hahn & Stroup, p. 13). In conclusion, the changing demographics of the U.S. will create a change in how one views ethnicity and race.

McKenney and Bennett (1994) described the complex problems of collecting and presenting data on race and ethnicity. The researchers' paper represents experiences of the Bureau of the Census regarding race and

ethnicity. Ethnic self-identify and concepts, intent of the question, consistency of reporting, and the classification of persons of mixed racial parentage have been shown to affect the quality of the data.

The bureau has collected information on race since the first census in 1790, when categorical placement was determined by the enumerator. Since 1960, race has been determined by self-identification by the respondents. A question concerning Hispanic origin was first used in 1970 and was by self-identification. The 1990 census data is currently being used to identify problems and solutions to collect more quality data for the 2000 census.

The Report of the Public Health Task Force on Minority Health and Human Services (U.S. Department of Health and Human Services, 1992) indicated a strong need for better written questions on race and ethnicity. This warning must be heeded because the national trends indicate that in 1970, nearly 88% of the U.S. population identified themselves as white, 5% Hispanic origin, 1% black, and 1% American Indian, Eskimo, and Aleut, or Asian and Pacific Islander. During 1980 the Hispanic people grew by 53%, from 15 million in 1980 to 22 million in 1990.

McKenney and Bennett indicated that when census data are compared to public health data there are several reasons why race and ethnicity differ. Several of those reasons are different data collection methods, different content and format, and different definitions or classifications systems. For

example, the Bureau of the Census has traditionally followed the guidelines of the Federal Statistical Policy Directive No. 15, which was issued by the Office of Management and Budget in 1978 (Cresce, Lapham, & Rolark, 1992). This directive enforces the collection of at least four different racial groups: American Indian or Alaska Native, Asian or Pacific Islander, black, White; and one ethnic group, Hispanic. However, these categories are not accompanied · by an "other" category. In the 1990 census, write-in entries were collected. Interestingly, the National Center for Health Statistics (NCHS) codes such entries as Hispanic or Mexican as white in the race item on vital records.

McKenny and Bennett (1994) identified several ethical, political, theoretical, and practical issues concerning treatment of different ·population groups. The methodologies used for the 2000 census must consider overlapping concepts of race and ethnicity, the concept of race, and particularly classifications of persons of mixed race. The Census data indicated that the interracial couples have increased in recent decades from 157,000 in 1960 to more than 1 million in 1992. The number of children has increased from 100,000 to more than 1 million in 1991. For this reason, the authors predict that future data collection efforts must become more sensitized before accurately reflecting the changing demographics of the U.S. population through statistical data collection.

Williams, Lavizzo-Mourney, and Warren (1994) claimed that race is an

"unscientific, societally constructed taxonomy that is based on an ideology that views one human population groups as inherently superior to others on the basis of external physical characteristics or geographic origin" (p. 26). This idea places focus on the true barriers to social acceptance that may lie within the minds of those individuals who emphasize differences based on physical differences, but not respect the differences that lie within a group of common people. That is, there is more genetic variation within races than between them, and racial categories do not capture biological distinctiveness" (p. 34).

From this discussion on race and ethnicity and public health surveillance by CDC and ATSDR, several recommendations were made. For example, researchers indicated that the terms race and ethnicity are not well defined or consistently measured among Federal agencies. Also, race has always been used as a social measure. It was stated that "biological or genetic reference...should be made with extreme caution" (p. 5). Furthermore, race and ethnicity have often been used to stigmatize and stereotype. When this information must be collected, it is necessary for investigators to explain the reason for collection and what it means. Most importantly, data collection of any ethnicity or race should be guided by those within the intended population. This ensures that those being investigated are treated with sensitivity during planning, implementation, and evaluation procedures.

The Prevention of Cardiovascular Disease in the

Hispanic Population

The need for research involving Hispanic subjects is growing steadily. Because of the changing demographic situation, the picture of health care will be different and require different solutions. The following group of literature reviews attempts to outline the problems confronted when implementing programs in the Hispanic population. The results, although not dramatic, emphasize the need for repetitive attempts at understanding how Hispanics change health behavior.

Cousins et al. (1992) compared a family-based intervention with a traditional program oriented to the individual for achieving weight loss by obese Mexican American women. Subjects ($\underline{N}$ = 168) were recruited through media promotion, and personal contacts within the community, churches, and health agencies. Those individuals who were hypertensive, diabetic, or had any chronic illness were rejected as subjects. The analyses included those women for whom weight data was available at 3, 6, and 12 months.

Subjects were stratified according to weight and randomly assigned to one of the three treatment groups: (a) the manual-only comparison group, (b) the individual group, (c) and the family group. The manual only group received a bilingual manual consisting of a low fat eating plan, nutrition information, recipes, an exercise plan, and behavior modification strategies, based on a

previously developed program and modified to reflect the cultural values of the population. The individual group received the manual and attended 24 weekly classes and 6 monthly classes taught by bilingual registered dieticians. The classes provided individualized instruction on nutrition, feedback about subject's food records, and behavior modification techniques for weight loss. Group exercise, food tasting, and cooking demonstrations were also included. The family group also attended the weekly classes, but received a modified version of the manual. The manual was changed to emphasize methods for modifying family meals and encouraging partner support and parenting skills. Children's classes were scheduled for the family group. Weight, height, and body mass index (BMI) were measured at baseline, 3, 6, 12 months.

A preliminary analysis revealed no significant differences in the groups in years of education, age, acculturation, income, initial weight, or BMI levels. Although not statistically significant, results indicated a linear trend in both body mass index and weight reduction across the groups, with losses greatest in the family group, then the individual group, and least in the comparison group. Researchers believed that support from the group and the instructor may have provided a strong support system in the subjects' weight loss.

Cousins et al. suggested that more research should be conducted that emphasizes natural support groups with the Mexican American population. Strategies included offering activities for husbands, while wives were in

nutrition classes. Also, many subjects reported that there were obvious attempts by other family members (e.g., sisters, mothers, cousins) to sabotage efforts to lose weight. The researchers concluded that interventions can not change the culture of the Mexican Americans to improve mortality rates. There must be a concerted effort through news mediums, clinics, and community channels to achieve the most effective results and long-term behavior change.

Mitchell, Hazuda, Haffner, Patterson, and Stern (1991) studied cardiovascular disease among Mexican-Americans and non-Hispanic Whites in San Antonio, Texas. The study recruited subjects ($\underline{N}$ = 5,148) to ascertain the prevalence of myocardial infarction, risk factors, and self-reported history of physician-diagnosed heart attack.

The first phase of the study was between 1979 and 1982. The second phase was conducted from 1984 to 1988. Three types of neighborhoods were studied: (a) a barrio or low-income neighborhood, (b) a middle-income transitional neighborhood, and (c) a high-income suburb. Those selected were men and nonpregnant women, ages 25 to 64 years of age, who agreed to participate in a physical examination in a mobile clinic. Medical history, electrocardiograms, blood pressure, fasting glucose samples were administered to all subjects. A total of 3,281 Mexican-Americans and 1,867 non-Hispanic whites were examined in the San Antonio Heart Study.

The results showed that, except for cholesterol levels and smoking, all cardiovascular risk factors were significantly less favorable in the Mexican-Americans than in non-Hispanic whites. Mitchell et al. concluded that studies should be conducted that reflect reasons why Hispanics are prone to more risk factors than whites, but have a lower mortality.

Stern et al. (1987) studied the decline in ischemic heart disease mortality in the American population. This decline occurred in the 1960s and has been falling steadily since. The researchers found that Mexican-Americans experienced the smallest decline. The purpose of their report was to describe trends in ischemic heart disease death rates in the Mexican-American population and non-Hispanic white population of Texas during the 1970 to 1980 decades. Surnames of Mexican-American origin were used to identify subjects. Subject's ($\underline{N}$ = 14,435) names were obtained from the Bureau of Vital Statistics, Texas Department of Health.

The Generally Useful Ethnic Search System (GUESS) was used to indicate potential subjects with Spanish Surnames. Only those individuals having died of ischemic heart disease (chronic) were used. Age-specific death rates for total ischemic heart disease, acute myocardial infarction, and all other chronic heart diseases were computed.

Results indicated that percent changes in age-adjusted rates from 1970 to 1980 were all highly statistically significant ($\underline{p}$ < .001), except for chronic

ischemic heart disease in Spanish-surnamed men. Age-adjusted mortality in women was lower among whites with non-Spanish surnames than among Spanish-surnamed whites in both 1970 and 1980. The opposite effect was seen in men. Consistent declines in ischemic heart disease were seen across all age, sex and surname groups. The percent decline for men of both ethnic groups was 11.1% and 13.5% for women with Spanish surnames. However, a steeper decline occurred in Spanish-surnamed women (21.75%). Total ischemic heart disease and acute myocardial infarction showed the least marked decline in Mexican-American men when compared with whites.

Stern et al. concluded that Mexican-Americans may experience a slower decline in ischemic heart disease because of primary and secondary prevention efforts. Changes in lifestyle and health habits and medical care may not penetrate this culture as readily as the white population. Also, there needs to be a concerted effort at understanding the etiology of coronary heart disease in the Mexican-American population.

An additional study by Farrell, Kohl, and Rogers (1987) involved investigates of the effect ethnicity had on differences in fitness-related variables. The researchers believed that many studies differentiated whites, blacks, and Mexican-Americans with regard to fitness levels, but the studies did not control for socioeconomic status, job classification, educational background. Another focus of the study was the prevention of cardiovascular

disease in women, since few studies focused on this gender. Subjects ($\underline{N}$ = 2,833) were recruited from the Dallas Independent School District (DISD), which had a cross-section of ethnic groups.

The subjects were given a self-administered health and lifestyle questionnaire, which assessed medical history, smoking habits, exercise habits, job satisfaction, and demographic characteristics. Blood samples, blood pressure, body fat, and submaximal stress test were administered to all subjects. After physical measurements were gathered, participants were counselled in groups and individually and given exercise and nutrition prescriptions. During the study, subjects were assigned to structured group exercise classes and educational modules. Participants were responsible for documenting exercise habits. For the purpose of the study, subjects were grouped into white ($\underline{n}$ = 1,316), black ($\underline{n}$ = 518), and Mexican-American ($\underline{n}$ = 133) subgroups based on self-reported demographic data. A univariate analyses of variance were performed on all clinical variables and socioeconomic variables of education level and marital status.

The results of the study indicted that blacks ($\underline{X}$ = 261.5 s) had a significantly lower mean treadmill time than white ($\underline{X}$ = 322.7 s) or Mexican-American ($\underline{X}$ = 320.8 s) subjects ($\underline{p}$ < .0001). Also, adjusted mean treadmill times for the three groups showed that Black women had significantly lower treadmill performance than White women. Adjusted mean treadmill

time for Mexican American women was not significantly different from the other two groups. The researchers contributed this to the small sample size of Mexican Americans (n = 133). There was also a lower incidence of smoking in Mexican-American subjects than other ethnic groups. Also, the average weight and body fat was not significantly different for Mexican-Americans than for other groups. The researchers stated that the higher socioeconomic status of women in this study could have affected this variable.

Farrell et al. concluded that differences in fitness levels must be considered when designing programs at the worksite for racially and ethnically mixed groups. More studies should also focus on the relationship of socioeconomic status, gender, and fitness status.

Although there is a steady decline in the morbidity and mortality rate of ischemic heart disease occurring in the United States among all ethnic groups, it remains the leading killer of Americans today. Many of the strategies used to combat this disease are aimed at populations where health messages can easily be received and understood. However, the Hispanic population is at an increased risk because of socioeconomic barriers and lack of sensitive health care. Health educators and other professionals must establish the resources necessary to identify needs of Hispanics in the community and those barriers to health care or behavioral change. Traditional, existing programs and services for other populations will not meet the needs of this group. The previously

reviewed studies and many other investigations suggest that cardiovascular disease is a threat to the quality and quantity of life for Hispanic Americans. Furthermore, an active lifestyle is necessary to combat many of the risk factors that impede their health. The following literature review emphasizes the impact that exercise in varying intensities, frequencies, and durations can have on long-term health.

Physical Activity and Physical Fitness in the Prevention of Cardiovascular Disease

The terms, physical activity and physical fitness, may seem similar in connotation. While physical activity indicates a leisure-oriented approach to health, physical fitness is a marker for improved performance and functioning in sports or competitive activities. Each has a different purpose and a different intended audience.

Blair, Kohl, and Barlow (1993) investigated the association between physical inactivity and mortality rates. The purpose of the study was to evaluate the relationship of sedentary living habits to all-cause mortality in men and women and compare the results. The subjects ($\underline{N}$ = 13,334) were followed for eight years.

To be included in the study, all participants must have been free of diabetes, myocardial infarction, hypertension, stroke, or abnormal resting or

exercise electrocardiograms. Physical fitness was measured by a maximal exercise test on a treadmill. Physical activity was assessed by questions on exercise habits included on a questionnaire. Participants responded to 18 common recreation activities. Mortality data was gathered by using the Social Security Administration files, state departments of motor vehicles, and the National Death Index. At the conclusion of the study, there were 240 deaths· in the male cohort and 43 deaths in the female cohort.

The results of the prospective study indicated that there was a significant inverse relationship between age-adjusted all-cause mortality rates and physical fitness ($p < .001$). For women, death rates indicated that low, moderate, and high categories of physical fitness had death rates of 40, 16, and 7 per 10,000 person-years of follow-up, respectively. Death rates did not differ for categories of physical activity. However, for men, physical activity and physical fitness had a significant inverse relationship with mortality risk

Blair et al. suggested that although the findings in mortality studies are important, there may be a drastic underestimation of the impact that sedentary living has on mortality rates. This may be attributed to the method of collecting data on physical activity. Studies on the relationship between mortality risk and physical activity are needed, as well as the methods of collecting this data.

Young and Steinhardt (1993) examined the relationship of physical fitness

and physical activity to coronary artery disease (CAD). The intent of the investigation was to determine which variable had the strongest association with the disease. Subjects (N = 412) were male law officers in the City of Austin, Texas and had a mean age of 35.9 years. The sample consisted of caucasian (71%), Hispanics (18%), blacks (10%), and other (1%).

Cardiovascular fitness was assessed by maximal treadmill exercise testing using the Bruce protocol. Physical activity was measured by self-reported recall for the previous year. Subjects were asked to report their overall physical activity, with a range from 0 (avoiding walking or exertion) to 10 (run over 25 miles per week or spend 8 hours per week in comparable physical activity). A pilot test was conducted to compare the relationship between reported physical activity and tested physical fitness. The relationship (r = .73, p < .001) indicated a strong correlation.

Results indicated that higher maximal time on the treadmill was highly associated with higher levels of physical activity, F(4,381) = 45.13, p < .001. Using Wilks' criterion for determination of significance, a significant main effect was found across physical fitness levels for the dependent variables (all CAD risk factors), F(28,989.34) = 2.74, p < .001. However, there were no significant differences across physical activity levels for the CAD risk factors, F(28, 989.34) = .89, p > .62. A stepwise discriminant analysis indicated that percent body fat, number of cigarettes smoked per day, Type A behavior score,

and HDL cholesterol were the dependent variables responsible for the significant main effect of physical fitness level for the CAD risk factors. An ANCOVA revealed that percent body fat and number of cigarettes smoked per day were lower at higher physical fitness levels. Also, physical fitness levels were significantly different for the multiple logistic CAD risk score, $\underline{F}(4,366) = 3.69$, $\underline{p} < .01$. There also were significant differences among physical activity level for the CAD risk score, $\underline{F}(4,366) = 2.74$, $\underline{p} < .05$. The authors suggested that lower physical fitness levels and physical activity levels were associated with a higher CAD risk score.

Young and Steinhardt concluded that this study highlighted the beneficial effects that physical activity could produce with respect to lowered risk of CAD. Also, more public health efforts should be focused in creating opportunities for individuals to recognize physical activity as a preventive measure for CAD.

In a study by Duncan, Gordon, and Scott (1991), 102 sedentary females, 20 to 40 years of age, were studied with respect to the intensities of walking programs. The researchers studied the quantity and quality of walking programs necessary to decrease the risk of cardiovascular disease. Criteria for selection into the study are as follows: (a) did not smoke, (b) consumed fewer than three alcoholic drinks per day, (c) did not currently receive dietary interventions, (d) did not have cardiopulmonary and or musculoskeletal

diseases, (e) did not regularly exercise more than one day per week for the previous six months.

Subjects were assigned to control group (n = 21), aerobic walkers (n = 29), brisk walkers (n = 26), or strollers (n = 26). All experimental group subjects were trained under the supervision of an exercise physiologists for 5 days per week for 24 weeks. The treatment consisted of a standardized walking distance of 2.4 km for 5 days per week. The walking distance was gradually increased until all subjects reached a maintenance distance of 4.8 km by the seventh week of training. Initially, group assignments were 8 km/h, 6.4 km/h, and 4.8 km/h for the aerobic walkers, brisk walkers, and strollers, respectively. This distance was gradually increased until 100% of the prescribed intensity was achieved by the 14th week of training and maintained until the end of the study. After the intervention, resting blood pressure, lipids, VO^2 max, body weight, and percent body fat were measured at baseline and after 24 weeks of intervention.

The results indicated that cardiorespiratory and cardiovascular health-related variables were comparable at baseline for all treatment groups. The ethnicity of the subjects consisted of white (81%), black (17%), and Hispanic (2%) individuals. As expected, the aerobic walkers achieved the greatest gains in VO^2 max (5 ml/kg/min), while the brisk walkers (3 ml/kg/min) and the strollers (1.4 ml/kg/min) increased moderate and minimal levels. The

differences between the control group and treatment group on VO^2 max was significant ($p < .05$). Also, high density lipoprotein (HDL) concentrations increased significantly ($p < .05$) among aerobic walkers and strollers, but not in the brisk walkers or in the controls. The ratio of total cholesterol and HDL cholesterol was lowered significantly ($p < .01$) within the strollers, but not in any of the other three treatment groups. These data indicated that those subjects achieving only a minimal increase in fitness improved greatly in health variables.

Duncan et al. agreed that the findings were not of great magnitude, but important for public health initiatives. The researchers suggested that "from a public health perspective, it may be more advisable to focus on encouraging the masses to participate regularly in low-level activities rather than advising a few to do more vigorous exercise" (Duncan, Gordon, & Scott, 1991, p. 3299).

Debusk, Stenestrand, Sheehan, and Haskell (1990) evaluated the threshold duration of exercise necessary to produce training effects in 40 subjects. Individuals were excluded from the study if they had heart disease, hypertension, disorders limiting participation in exercise. All subjects had sedentary jobs and had not exercised in the previous six months. Initial data collected included a 12-lead electrocardiogram at rest and exercise, body height, weight and blood pressure. The subjects were randomly assigned to one of two treatment groups. The first group (long session) were given

exercise bouts that consisted of one, 30 minute session daily. The second group exercise three times daily at 10 minutes for each session (short session). Both training method consisted of jogging at an intensity necessary to produce a heart rate of 65 to 75% of the peak heart rate. This ranged from 116 to 133 beats per minute. The duration of the study was 5 days per week for a period of 8 weeks.

At completion, 36 subjects finished the requirements. Results indicated that maximal oxygen uptake (VO^2 max) increased 13.9% in the long session group and 7.6% in the short group session. However, statistics were only significant in the long session group. Decreases in weight (kg) were similar in the long (1.75 kg) and short (1.79 kg) sessions. The authors suggested that the shorter, multiple training sessions increased oxygen uptake 57% as much as a long, single training session.

Debusk et al. concluded that leisure time physical activity pursuits may be a viable weapon in reducing the incidence of coronary heart disease. Multiple bouts of moderate exercise may provide effects traditionally reserved for higher intensities of single bouts of exercise.

Sedgwick, Davidson, Taplin, and Thomas (1988) studied previously sedentary women and the effects of physical activity on risk factors for coronary heart disease. The prospective study was a follow-up to an initial study which involved measured fitness levels, weight, blood pressure, and lipids

in 290 women. Those who remained active after the initial fitness program (38%) were contacted for entry into the retrospective study five years later. Criteria for the retrospective study were: (a) entry examination/screening before joining the initial fitness program, (b) enrollment in the program, and (c) follow-up examination five years later after entry. The same variables were measured posttest. Physical examinations remained the same pre and post intervention, however, other questions were asked at follow-up. A questionnaire containing information on smoking habits, physical activity habits between entry and follow-up, energy expenditure during occupation, leisure, and recreation. The fitness program or intervention consisted of 12 weeks of twice-weekly one-hour sessions of stretching, aerobic activity. Short discussion session included information on motivation, maintenance of program, and other strategies for remaining in the program.

The results showed a 13% significant increase in fitness ($p < .05$), but no difference in weight or risk factors. The study consisted of 51 (18%) smokers at entry. An analysis of variance showed that the ability to quit smoking was strongly associated with being in the "active" group.

Sedgwick et al. suggested that exercise may be an intervention strategy to promote cessation of smoking. Also, there may need to be more attention given to the relationships between behavior (e.g., diet and exercise) and health risk factors on an individual basis.

The roles of physical activity and physical fitness have received heightened attention recently. Much of the debate centers around the viability of reduced intensity of exercise as a medium for increasing health and improving the quality of life. However, according to the studies reviewed here and elsewhere, both traditional and tailored approach to exercise have merits. The well-being of the population represents an interesting but varied challenge to health educators and fitness professionals. It would seem likely that the tailored-approach to exercise has been created to satisfy the needs of those populations not psychologically, mentally, or physically ready for vigorous exercise. This choice provides a framework for professionals seeking new strategies for long-term exercise adherence. The following literature highlights the new research on the Exercise Stages of Change Model and its effect on health. Also, the impact of self-efficacy and exercise adherence is previewed.

The Stages of Change Model and Self-Efficacy as a Framework for Changing Exercise Behavior

The Exercise Stages of Change Model was developed to provide a stepwise approach to changing health behaviors. For the health educator, this purports a very important message. Health educators need to understand the barriers that hinder the closing of the gap between what individuals know about health behavior and what they actually practice. However, it is equally

important that we find the incentives, benefits, and motivations that the individual possesses to want to change the behavior. The Exercise Stages of Change, proposed by Marcus, provide the individual and the health professional with points of varying strategies and interventions. Its implementation is sensitive to the understanding that behavior change does not occur in a categorical fashion, but instead progresses along a continuum. The following reviews of literature are examples of the recent research using the Exercise Stage of Change approach and self-efficacy model for changing exercise behavior.

Booth et al. (1993) studied sociodemographic variables, beliefs about the health benefits of exercise, and the Stage of Change Model. Data were collected on 4,404 Australian adults as part of an evaluation conducted by the National Heart Foundation campaign. Heart Week 1990, which was funded by the foundation, was a nationwide mass communication effort intended to promote the effects of regular exercise on the prevention of cardiovascular disease. Two independent random samples of adults were selected and interviewed two weeks prior to the campaign ($\underline{n}$ = 2,200) and four weeks after the national campaign ($\underline{n}$ = 2204). Questions asked at each observation were, "Which statement best describes how much you now exercise and how much you intend to exercise in the future?" Possible selections included the following: (a) I do not exercise and do not intend to start, (b) I do not

exercise, but am thinking of starting, (c) I exercise occasionally and am not thinking of doing more, (d) I exercise occasionally, but am thinking of doing more, (e) I exercise regularly and intend to continue. Based on the selection, participants were placed into one of the five stages created by Prochaska. The intent was to measure the impact of the promotional campaign on current and future beliefs and actions regarding physical activity in the community.

The results indicated that 22% of the sample were inactive (precontemplators). Of this sample, 50% were thinking about initiating exercise (contemplators). Of the 40% involved in occasional exercise (action), 50% were thinking of doing more exercise (maintenance), and 38% exercised regularly and planned to continue this activity (termination). Booth et al. (1993) determined that regardless of the reported level of activity, the likelihood of intending to increase the amount of activity declined with age. Also, those persons who were at a higher stages of change level were more likely to have a higher education. Positive exercise beliefs (i.e., the belief that exercise could prevent heart disease) were seen significantly more in participants who were ranked in the higher stages of change levels.

Based on their research, Booth et al. concluded that the intention to change exercise behavior varies across different populations. Also, the researchers strong support that health beliefs, sociodemographic variables, barriers to change may impact readiness for change.

Marcus and Simkin (1993) chose the Stage of Change Model to study the behaviors of employees at a retail outlet and an industrial manufacturer. The subjects (N = 235) had a mean age of 40.6 years and the average education was 12.6 years. About 60% of the employees were involved in white-collar occupations. Participants were asked to rate their involvement with exercise by answering true or false to statements and to describe in detail their activity level in terms of moderate, hard, and very hard intensity using the 7-day Physical Activity Recall Questionnaire (PAR-Q). The true or false statements were as follows: (a) I currently do not exercise, (b) I intend to exercise in the next 6 months, (c) I currently exercise regularly, (d) I have exercised regularly for the past 6 months, and (e) I have exercised regularly in the past for a period of at least 3 months. Participants were invited to join the study by the Chief Executive Officer of the two worksites. Those entering the study were asked demographic information, signed an informed consent, and entered into a drawing for $100 prize. The subjects, based on data collected, were placed into one of three stages of change categories (i.e., precontemplation/ contemplation, preparation, action/maintenance).

Results indicated that 22.4% of the subjects were precontemplators, 28.3% were contemplators, 17.8% were in the preparation stage, 8.7% were in the action stage, and 22.8% were on maintenance. Univariate statistics revealed a significant difference between group effect for total minutes of

vigorous activity in the past week, $F(2,218) = 20.57$, $p < .001$. Tukey tests for post hoc comparisons of means revealed that subjects in the action/maintenance group reported significantly more minutes of vigorous activity than subjects in preparation and precontemplation/contemplators. Subjects in the action/maintenance group reported significantly more moderate activity than those in precontemplation/contemplation group, $F(2,218)=9.09$, $p<.001$. Years of education was significant higher in the action/maintenance group ($M = 13.1$ years) than in the precontemplation/contemplation group ($M = 12.2$ years).

Marcus and Simkin suggested that the stage of exercise behavior is indicative of self-reported physical activity. They further added that the stage of change can "enhance the design and delivery of exercise interventions" (Marcus & Simkin, 1993, p. 87).

Marcus, Banspach, Lefebvre, Rossi, Carleton, and Abrams (1992) examined the Stages of Change Model to design an exercise intervention for community volunteers. The "Imagine Action" campaign was a community-wide event which sought the involvement of local worksites and community agencies to increase the adoption of exercise behavior. Subjects ($N = 610$) who were living in Rhode Island were ages 18 to 82 years old ($M = 41.8$).

To measure the current stage of exercise adoption, one question was asked on the campaign registration form and again at postintervention.

Participants were asked to respond to the question, "Which statement best represents your feelings about being more physically active." Possible selections were: (a) "I'm not very active, I don't exercise, and I don't plan to start," (b) "I've been thinking about being more active, but I just can't get started," (c) "I exercise once in a while, but I could do more," or (d) "I've started exercising regularly, but it's tough to keep it up." Demographic information collected was height, weight, level of education, job classification, and income. At postintervention, participants were asked what type of moderate and vigorous intensity activities they participated in presently. Based on data collected prior to the intervention, subjects were placed into the precontemplation, contemplation, preparation, or action stage. Because of a lack of respondents ($\underline{n}$ = 5) researchers chose not include precontemplators or seek those who described themselves as being in the maintenance stage.

The intervention included a six-week program of written materials on physical fitness and a resource manual describing community fitness activities. The written materials were based on strategies appropriate for the level of readiness. For example, subjects categorized as contemplators were sent materials titled, "What's in it for you." This focused on creating opportunities for movement in daily activities, rewards, incentives, and social benefits of exercise. Those in the preparation stage were sent the manual, "Ready for Action." The focus was on costs and benefits of activity, rewards, time

management, and details on developing a walking program. For the subjects in the action category, a "Keep it Going" manual was designed with troubleshooting strategies, cross-training, injuries, and exercise partners.

At the conclusion of the six-week intervention, a telephone campaign was conducted on a stratified random sample of all participants ($\underline{n} = 401$). The goal was to reach at least 33% of the subjects in each stage studied. Trained research assistants gathered data on exercise status, activities performed in the last six weeks, and demographic information. Approximately 236 interviews (59%) were completed. Results indicated that of the total sample, 39% were contemplators, 37% were in the preparation stage, and 24% were in the action stage. A Stuart-Maxwell test for correlated proportions indicated that the subjects were significantly more active after the six-week intervention program, X^2 (2, $\underline{N} = 236$) = 64.55, p < .0001. For those in the contemplation stage at baseline, 31.4% advanced to the preparation stage and 30.2% advanced to the action stage at follow-up. Approximately 61% of those identified as in the preparation stage at baseline progressed to the action stage at follow-up. However, only 4% regressed to the contemplation stage. Of those who were already in the action stage at baseline, less than 10% regressed to an "earlier" stage of change. There was no significant difference in postintervention stage of exercise adoption and gender, body-mass index, education, job classification, or income.

Marcus, Banspach, Lefebvre, Rossi, Carleton, and Abrams (1992) concluded that the Exercise Stages of Change Model provides a framework for understanding how people change. It also provides strategies for successful behavior change which does not focus on quickness of change, but quality of change.

Marcus, Selby, Niaura, and Rossi (1992) examined the application of constructs of Exercise Stage of Changes Model and self-efficacy to exercise in three separate studies. Study I ($\underline{N}$ = 1,063) was dedicated to instrument development, Study II ($\underline{N}$ = 429) was primarily concerned with instrument refinement, and Study III ($\underline{N}$ = 20) tested instrument reliability. For Study I, the subjects average age was 41.1 year old and most employees were blue-collar workers. First, each subject completed a questionnaire on stage of change and was placed into one of the four stages (i.e., precontemplation, contemplation, action, or maintenance) based on their responses. Second, the participants were then asked to complete a five-item self-efficacy measure designed to measure confidence in one's ability to persist with exercising in various situations. Questions were constructed to reveal if participants would be confident in participating in exercise when they were tired, in a bad mood, lacking time, on vacation, and it was poor weather. Subjects used an 11-point scale, with 1 indicating "not confident at all" and 11 indicating "very confident."

Results for Study I revealed internal consistency for the self-report five-

item self-efficacy scale was .82. Also, total scores on the self-efficacy items differentiated employees at different stages, $\underline{F}(3,861) = 85.93$, $\underline{p} < .001$. Further results indicated that higher scores on the self-efficacy scale related strongly to a higher stage of change. Results for Study II indicated similar results with self-efficacy begin related strongly to stage of readiness, $\underline{F}(4,369) = 36.57$, $\underline{p} < .001$. The instrument reliability study indicated that test-retest reliability for the self-efficacy scale over a two-week period was .90 ($\underline{n} = 20$). The kappa index of reliability for the stages-of-change instrument over a two-week period was .78.

Marcus, Selby, Niaura, and Rossi suggested that health promotion professionals designing interventions might improve program dissemination if attention is placed on self-efficacy of the specific activity. However, they concluded that more research and intervention trials need to be attempted to secure a better understanding of the relationship between self-efficacy and progressing to a higher stage of change with exercise.

In a study on predicting long-term adherence to exercise, Garcia and King (1991) compared two different models. Research questions were: (a) How does self-efficacy compare with self-motivation in terms of predicting short- and long-term behavior? and (b) Will certain aspects of the exercise experience contribute significantly to explaining the variance in exercise adherence, independent of the variance explained by self-motivation and/or

self-efficacy? Subjects ($\underline{N} = 74$) were sedentary, healthy (i.e., no diagnosed cardiovascular disease), and ages 50 to 64 years.

Subjects were male (57%) and female (43%) and were recruited via telephone procedure or city-wide campaign. The subjects were assigned to the following categories after baseline measurement: (a) assessment-only control (AOC), (b) moderate-intensity, supervised group condition (MIG), (c) moderate-intensity, supervised home-based program (MIH), and (d) low-intensity, supervised home-based program (LIH). Measurements were at baseline, 6 months, and 1 year. Psychological tests and a fitness tests were conducted. The Self-Motivation Inventory and the self-efficacy scale were administered to the subjects. The AOC group was assessed as the other subjects were, but no intervention occurred. Participants were asked to not change their exercise habits over the next year and were given monthly logs to measure cooperation. The MIG individuals attended morning or evening aerobic conditioning classes three sessions per week. A prescription was given to each subject based upon their last treadmill performance test (i.e., 65 to 80% of functional capacity). A warm-up, and aerobic conditioning, such as walking, jogging, cycles or treadmills were allowed. Subjects were asked to take their heart rate at the end of the 45 minute session. The MIH group performed the same activities and prescription as the organized class subjects, however, they were told to only exercise at home. Telephone contact was

maintained on a biweekly basis and then monthly. The LIH intervention was the same as the others except that they were instructed to exercise at only 50 to 60% of their functional capacity. The exercise behavior (i.e., frequency, intensity, and duration) was measured on all subjects. The self-efficacy scale involved subjects rating from 0 to 100% their confidence level on situations that may be potentially conflicting. Statements such as "I could exercise when tired or I could exercise when on vacation" are samples. An average of the percentages indicated their score. The SMI was a Likert-scale format and contained 40 items, such as "I can persist in spite of pain or discomfort," "I can change my mind about things quite easily."

This study revealed two significant relationships between the variables. Smoking status was found to be negatively correlated with adherence during the first 6 months of the study, (r = -15, p < .05). Also, marital status was significantly associated with adherence during the last 6 months, (F = 3.2681, p < .05). That is, people who were separated adhered to their programs less than people who were single, married, or divorced. When the two psychological constructs were compared, a strong relationship (r = .42, p < .001) was noted between self-efficacy and exercise adherence.

Garcia and King concluded that the data suggest support for using self-efficacy as a predictor scale over self-motivation scale. The self-efficacy scale should be tested further in studies with better methodology, retrospective

designs, and longer time periods.

It is important to envision these frameworks as tools for reaching underserved populations. As stated in the literature, there are reasons that 90% of the population do not enjoy the health benefits of regular exercise. Obviously, gaining knowledge about the etiological mechanisms of disease is important, but insufficient. The popularity of the stage of change model indicates that there is a need for models that develop with the individual, at the individual's pace, and is one that is not a pass or fail approach. This model is not a panacea, but it may provide new insight into how health professionals can reach those populations who are late adopters. Minority populations may benefit from the step-wise approach that this model offers. Because even individuals within the same culture do not change behaviors similarly, it can be expected that persons of another culture may react negatively to reused interventions.

Another promising avenue for research is that of persons who are disabled or diseased. Cardiovascular patients learning that they must make alterations in lifestyle choices struggle with implementing these changes immediately. Just as cardiac rehabilitation slowly moves the patient back to a functioning physical level, the Exercise Stage of Change Model provides a framework that allows the individual to approach needed lifestyle changes (i.e., reduction in cholesterol, smoking cessation, more active lifestyle, etc.) with a

gentler approach. It is this gentler approach that allows time for more self-awareness during the process of behavior change. Although this model provides for action, it is only one step in the process. Health professionals should be concerned with those interventions that allow forethought about what needs to be changed and the methods, strategies and skills necessary for making that change.

CHAPTER III

METHODOLOGY

The purpose of this study was to compare the effectiveness of two interventions in increasing the self-reported physical activity and exercise self-efficacy of Hispanics who were in the contemplation stage of exercise behavior change. The two interventions were (a) tailored-treatment (tailored) and (b) standard-treatment (standard). The dependent variables were stage of change and self-efficacy and were measured before and after the intervention. The intervention (standard and tailored) was the independent variable. The tailored group was given strategies based upon its level of readiness as assessed by the stage of change instrument (Marcus & Simkin, 1993). The standard group was given an intervention that was based upon the ACSM standard of "exercise performed three to five days per week, for 15 to 60 minutes per session, and at an intensity of 50% to 80% of maximal oxygen intake" (cited in Blair, Chandler, Ellisor, & Langley, 1980, p. 1594).

This chapter includes a description of the procedures followed in the development of the study under the following headings: (a) Preliminary Procedures, (b) Selection of Subjects, (c) Protection of Human Subjects, (d) Selection and Description of Instruments, (e) Description of the Intervention,

(f) Collection of Data, and (g) Organization and Treatment of the Data.

Preliminary Procedures

Prior to the beginning of the study, the investigator completed several preliminary steps. The related literature was studied and assimilated.

A prospectus was then developed and presented to the dissertation committee for suggestions and corrections. The outline was revised as suggested by the committee members. The Texas Woman's University Human Subjects Review Committee granted permission to conduct the study. The approved prospectus was filed in the Graduate School at Texas Woman's University.

Selection of Subjects

The population of interest in the study was Hispanic individuals who were currently sedentary, but were interested in beginning an exercise program. Marin and Marin (1991) defined Hispanic as "those individuals who reside in the United States and who were born in or trace the background of their families to one of the Spanish-speaking latin American nations or to Spain" (p. 1). For purposes of the study, the population was further delimited to Hispanics who met the following criteria: (a) self-identified as Hispanic, (b) at least age 18 to 65 years, and (c) apparently healthy or had approval of a

physician if high risk or with heart disease.

The settings for this selection of subjects were the Organization for Latin Americans, The Brady Center, East Dallas Health Center, Bluitt-Flowers Health Center, and Dallas SER-Jobs for Progress Program. The Organization for Latin Americans is a non-profit, bilingual/bicultural service agency located in Plano, Texas, with three main areas: education, job referral/training and social service. Plano has an estimated population of 128,713 people. The 1992 population by race and ethnicity was is described as white (85.4%), Hispanic (6.2%), black (4.1%), Asian or Pacific Islander (3.9%), and other (.4%).

The Brady Center, East Dallas Health Center, Bluitt-Flowers Health Center, and Dallas SER-Jobs for Progress Program are located in Dallas, Texas. The Brady Center is a service organization of the Catholic Charities of Dallas. There are two missions of the center: (a) a daily program for older adults, which includes meals, social, and health activities and (b) an assistance program for families in need. The East Dallas Health Center and the Bluitt-flowers Health Center are community oriented primary care programs offered by Parkland Hospital of Dallas. Their goal is to improve the health of individuals by establishing community-based health centers providing accessible primary medical care, health education, and community outreach. Dallas SER-Jobs for Progress Program is a nonprofit service organization dedicated to providing hope for the unskilled workers and non-English speaking population.

English-as-a-second language, office skills training, and GED Preparation courses are taught to the mostly Hispanic organization. According to the 1990 census data, Dallas has a population of 1,006,877. This population has a diverse ethnic composition, consisting of White (47.7%), black (28.9%), Hispanic (20.9), Asian (2%), and other (.5%) individuals.

A convenience sample was used in this study. This nonprobability sampling method was selected in order to insure an adequate sample size within a realistic time period. After being identified for the convenience sample, subjects were included once they gave consent and met the selection criteria. The final sample consisted of 57 Hispanics. Subjects were assigned to groups based on their recruitment site. A random assignment of treatment for each site was conducted by a coin toss. Those sites having a "heads" were administered the tailored intervention and those sites having "tails" received the standard intervention.

The intervention was delivered to either currently formed classes or to classes recruited by the present investigator. To recruit potential subjects, several procedures were followed. The investigator worked closely with all organization's Executive Directors or Program Volunteer Coordinators to determine possible avenues for recruitment. Information about the intervention was disseminated by visiting English as a Second Language (ESL) classes, orientation meetings, youth groups, and health classes, office skills

classes, clinic meetings, etc. Also, advertisements and fliers were placed in newsletters and on bulletin boards on a weekly basis. For a copy of a sample advertisement flier used for this study, see Appendix A. A site coordinator, or "gatekeeper," was identified for each location. This person, who was the contact person for subjects before, during, and after the intervention, was bilingual and was familiar with the individuals who frequented the sites. If an individual wished to enroll in a class, he or she called the site coordinator and left a name and home phone number. Information about class date, time and location was then given to the subject. At those sites where groups were already formed, the investigator attended a meeting and introduced the study to students. Subjects attended classes one day or night a week, for approximately one hour each session. A qualified interpreter was available for all class sessions. During the classes, special effort was given to assure comprehension of material.

Protection of Human Subjects

The study was designed to meet all rules and regulations of the Human Subjects Review Committee. For a copy of the permission letter from Human Subjects Review Committee, refer to Appendix B. Permission was obtained from the Executive Directors of all sites before beginning any procedures. The Executive Directors were informed about all actions taken during the study.

During the first class day of the intervention, subjects were given the opportunity to decline participation in the investigation. Once subjects agreed to participate in the study, they were given a consent form to read and sign. For a copy of the Subject Consent Form, see Appendix C. All subjects included in the data analysis were given a code number. The code number was used to identify subject's pretest and posttest data. A master list of name and code number was stored in a secure location kept at the investigator's home.

Selection and Description of Instruments

The questionnaires and instruments used in the investigation comprised the Subject Data Form, which included information about demographics, Cardiovascular Health Risk Factors, Exercise Habits, and Self-Efficacy. For a copy of the Subject Data Form, see Appendix D. Permission was given to the investigator to use each instrument in the present study.

Demographics

Subject demographic data included name, address, phone, gender, age, language preference, ethnicity, acculturation status, and highest level of education. Subjects were asked to classify themselves as Mexican-American, Puerto Rican, Cuban, South American, or Central-American. The subjects self-reported their highest level of education as being some grade school or

high school, high school diploma, some college, college degree, some graduate work, or graduate degree. Subjects were asked how long have they have lived in the United States. Although this is not a highly reliable assessment of acculturation, it does indicate to some degree the potential for acculturation. Cuellar, Harris, and Jasso (1980) indicated that "acculturation is a multifaceted phenomenon composed of numerous dimensions, factors, constructs, or subcomponents, not all of which have been clearly identified or specified" (p. 209). The measurement of acculturation status, however, was not the intent of the present investigation.

Cardiovascular Health Risk Factors

The first instrument used determined self-reported cardiovascular risk factors. According to the guidelines established by the ACSM, there are five risk factors that predispose individuals to cardiovascular disease. These are high blood pressure, smoking, high cholesterol, family heart disease prior to age 55, and diabetes. As stated previously, sedentary living has recently been deemed a major risk factor for heart disease. Risk factor status was ascertained in the form of a question in the present study (i.e., Do you smoke?, Do you have diabetes?, etc.). Based on the answers to these questions, individuals were categorized into one of the following categories: (a) apparently healthy, asymptomatic with no more than one major coronary risk factor; (b)

individuals at higher risk, symptoms suggestive of possible disease and/or two or more major coronary risk factors; (c) individuals with known cardiac, pulmonary, or metabolic disease. For the present study, those individuals who indicated two or more major risk factors or who had heart disease were instructed to obtain physician consent before participating in the study. Participants were given a consent form that they could take to their doctor. A copy of this consent form is located in Appendix E.

Participants were asked additional health questions, such as, "Are you pregnant or think that you may be pregnant?" "Has your doctor ever told you that you have heart trouble?" "Have you visited with your physician about your health within the last two years?"

Exercise Habits

Exercise habits were determined by using the Exercise Stage of Change Instrument. Developed by Marcus and Simkin (1993), the survey assesses the individual's level of readiness for exercise and their history of exercise. The questions addressed information such as, current exercise status, exercise history, and intention to exercise within the next six months. Depending on a response of "true" or "false," to each question, the subject was placed into one of the following categories: (a) precontemplation, (b) contemplation, (c) preparation, (d) action, or (e) maintenance. However, only those

individuals scoring in the contemplation stage were used in data analysis. For a copy of the Exercise Stages of Change Scoring Instructions, refer to Appendix F. Marcus, Selby, Niaura, and Rossi (1992) conducted instrument development, refinement, and reliability studies to ascertain the ability of the Stage of Change Questionnaire to accurately assess exercise behavior. The Kappa index of reliability for the instrument over a two-week period was .78 ($\underline{n}$ = 20).

Exercise Self-Efficacy

Information about exercise self-efficacy was obtained by using The Exercise Self-Efficacy Scale. This scale was created by researchers at the University of Michigan and Stanford University (Garcia, Selby, Niaura, & Rossi, 1992). Based upon recommendations made by self-efficacy theorists, this scale was deemed specific to exercise behavior. The construct consists of 15 items that assesses the individual's belief or confidence in whether he or she could exercise under certain conditions (e.g., when tired, depressed, on vacation, feeling anxious, etc.). They rate each statement using a yardstick of 0% (e.g., "I cannot do it at all") to 100% (e.g., "certain that I can do it"). An average of all percentages given was the score for this instrument. The researchers reported that the internal consistency of this scale at baseline was high with a Cronbach's alpha of .90. The test-retest correlation was .67 ($\underline{N}$ =

62, p < .001). Using a modified version of the self-efficacy scale, other researchers (Marcus & Simkin, 1993) have reported a test-retest (product moment) reliability over a two-week period as .90 (n = 20). The internal consistency was also reported to be .76 (n = 388). This modified version included only questions concerning confidence in exercise ability when participants are tired, in a bad mood, do not have the time, on vacation, or when it is raining or snowing.

Pilot Study

The purpose of the pilot study was to determine the validity of the Exercise Stage of Change Instrument and the Exercise Self-Efficacy Scale with Hispanics. A focus group was conducted to determine how well the two instruments translated into Spanish and were understood by individuals similar to the study sample. An English as a Second Language (ESL) class served as the subjects for this study. The subjects (N = 13) ranged in age 20 to 65 years (X = 31.92 years). All subjects were Hispanic, being from Mexico (n = 12) or Central America (n = 1). Of the study group, seven were male and six were female.

The focus group began with an introduction of the study. Each subject was given an English and Spanish version of the consent form and the two instruments. A qualified Spanish translator was present during the study.

Subjects were asked to read the consent form and if they had no questions, to sign and date the form. The translator paraphrased the intentions of the study. After the subjects completed the questionnaires, they were asked to discuss their reactions. Subjects were asked the following questions: (a) What do you think the questionnaire was trying to ask you?, and (b) Were there any words or phrases that were hard to understand?

After the focus group meeting, the investigator tabulated the Exercise Stage of Change and Exercise Self-efficacy scores for all subjects. Results indicated that the group consisted of individuals in the precontemplation (n = 1), contemplation (n = 4), preparation (n = 1), and maintenance (n = 7) stages. The self-efficacy score on the first 13 items was 48.69%, with a range of 0% to 78.46%. In response to the statement, "In general, I believe I could exercise at my target heart rate three to five times per week for 30 to 40 minutes over the next 6 months," the confidence rating was 77.69%. The range for this statement was 20% to 100%. Participants mostly agreed that the survey was about health and disease. The question that seemed to be the most complicated was, "In general, I believe I could exercise at my target heart rate three to five times per week for 30 to 40 minutes over the next 6 months." However, during the translation process, the phrase "target heart rate" was very difficult to translate in context. Therefore, another phrase, "...a lo óptimo de mi latido cardíaco..." (i.e., at my optimum heart rate) was substituted. In

addition, the subjects remarked that the consent form was too difficult to understand and contained too much information to comprehend. Even those who spoke only Spanish could not comprehend the translated version.

After the focus group meeting, brochures were given to participants on a variety of topics, such as heart disease, high blood pressure, nutrition, and exercise. The group was also given pencils inscribed with "Celebración de la Salud Cardíaca."

Description of the Intervention

The intervention was a five-week course entitled, "Celebración de la Salud Cardíaca" or "Celebration of Heart Health," which was designed by the investigator. All course materials, including manuals and advertising, were prepared by a qualified translator. This individual holds a Bachelors Degree in Spanish and English, Master of Arts in Spanish and has completed coursework and competency examinations for a PhD in Modern Languages. He also has 28 years of teaching the Spanish language at the collegiate level.

The intervention was divided into two distinct subinterventions: (a) the tailored-treatment intervention (tailored) and (b) the standard-treatment intervention (standard). The standard groups ($n = 28$) received an intervention that closely followed the American College of Sports Medicine (ACSM) exercise guidelines, whereas, the tailored groups ($n = 29$) were given

an approach that was based on the contemplation level of readiness. All subjects received a class manual that was designed by the investigator specifically for the intervention.

Tailored Intervention

The tailored intervention consisted of class activities, such as cognitive mapping, visualization exercises, and breathing and stretching. Topics for discussion during the five weeks were, "How to get moving throughout the day," "Psychological and physical benefits of movement," "How to breath," "Understanding your social support system," "Enjoying the process of movement," "How to reward yourself," "Barriers to moving," "Goal setting for a life of movement." For a copy of the Tailored Intervention Instructor's Manual and Student Class Manual, see Appendices G and H, respectively.

Standard Intervention

The standard intervention consisted of activities, such as taking resting and exercise heart rates, stretching, calculation of target heart rates, measurement of blood pressure, completion of activity logs, and designing personal exercise prescriptions. Discussion during the five weeks considered, "Major risk factors for cardiovascular disease," "Taking your pulse during exercise," "How to prevent cardiovascular disease with exercise," "The

frequency, intensity, and duration formula for exercise," "Calculating your target heart rate," "How to walk for health," "Normal values for blood pressure, resting heart rate," "Achieving and maintaining your appropriate body weight" and "Exercise goals." For a copy of the Standard Intervention Instructor's Manual and Student Class Manual see Appendices I and J.

Differences Between the Tailored and Standard Intervention

The differences between the two interventions lie in the characteristics of their delivery and content material. The tailored intervention has the following characteristics and is based on methodology created by those presently conducting stage of change research (Marcus, Banspach, Lefebvre, Rossi, Carleton, & Abrams, 1992):

1. The tailored approach is not goal oriented, but process oriented. Individuals are encouraged to enjoy movement "for movement sake."

2. Individuals are encouraged to seek all types of movement and build activity into their day (i.e., climbing stairs, walking to the store, playing with children, rhythmic breathing, etc.). Strategies are offered on not making movement or exercise so structured, but instead more natural.

3. Activity and exercise are not used as means to an end (e.g., to prevent cardiovascular disease), but instead are used as methods of feeling better about yourself and your environment.

4. The tailored approach considers the negative images that individuals may have of exercise. Strategies for dealing with situations where exercise is not a positive choice are discussed (i.e., raining, tired, busy, etc.).

5. Participants are encouraged to visualize themselves moving in any form through mental imagery. Relaxation tapes are used to set the mood and tone.

6. Participants are led through stretching exercises, but are not told "where to feel it." The instructor uses statements, such as "Listen to your body," "Where do you feel this movement the most?" The benefits of stretching as a good movement exercise in itself is emphasized. Stretching is not used as a "pre-warmup" to anything.

7. Improved numerical values (i.e., blood pressure, heart rate) are not emphasized in the tailored approach.

8. Resting heart rate is not determined or calculated. Participants use the "talk test," or use a perceived exertion scale to monitor their intensity level. The instructor emphasizes that students can be "their own best judge" of activity intensity.

The standard intervention has the following characteristics and is based largely on traditional views of exercise:

1. Exercise is used as a means to an end (i.e., to prevent cardiovascular disease).

2. Risk factors are stressed as reasons for exercising.

3. Participants are taught that their heart rates need to be within a certain range based upon their age and resting heart rates. They are taught how to calculate and determine by palpation if they are reaching the necessary intensity during exercise.

4. Participants are encouraged to document their exercise, weight, blood pressure, and resting heart levels.

5. Body image is emphasized in the standard approach by stressing that "what you look like" can have a negative impact on your health.

6. Participants are given a sample walking program to follow during the class. Emphasis was placed on the "frequency, intensity, and duration" formula for exercise.

7. As in the tailored approach, participants are led through stretching exercises. However, individuals are told "where they should feel it." Stretching is used as a precursor to aerobic activity, not as a viable activity in itself.

Interpretation Procedures and Services

Interpreters were located for the study and asked if they would be willing to complete each class at the specified day and time. Interpreters were experienced, qualified translators. All worked presently in occupations that used their translation expertise. All interpreters met with the present

investigator in an orientation meeting before beginning the sessions.

Interpreters were given the following information and materials: (a) permission

letter from TWU Human Subjects Review Committee, (b) pre/posttest

instrument, (c) consent forms, (d) instructor's manual for standard and tailored

approaches, and (d) student class manuals for standard and tailored

approaches. This orientation was a working session and involved providing

details to the interpreter about the goals, procedures, and methodology of the

investigation. All interpreters were given information about both types of

interventions (i.e., tailored and standard) so that they understood the intent of

the research. Interpreters were told that during the class sessions that it was

important to translate only the material the investigator presented, so as not to

contaminate research findings. During the working session, interpreters

searched for phrases or words that might be confusing or difficult to translate.

Some English words or phrases do not translate well or have the same

connotation in Spanish. After all investigation procedures were understood,

the interpreters were given a copy of the schedule with dates, times, and

location. An agreement was made that they would be paid $15 per hour for

interpretation services. Interpretation services included: (a) providing

translation assistance before, during, and after class sessions, (b) acting as a

recruiter, if interpreter worked at one of the investigation sites, and (c) calling

subjects on a weekly basis to promote subject attendance. Interpreters were

asked to read and study the materials provided to them. The investigator called each interpreter one week before beginning the sessions to remind them about the study and to answer any questions about the investigation.

The interpreter was present at all meetings regardless of the language preference. The delivery style of the intervention had the following characteristics:

1. The instructor stated a concept, usually one to two sentences, and the interpreter translated.

2. The instructor and the interpreter observed closely for those individuals that expressed a misunderstanding of the content. Concepts were repeated and the instructor often asked, "Do you have any questions or comments about what I just said."

When the intervention for each site ended, the interpreter was given a schedule of the dates and times worked and the total amount owed. For a copy of the interpretation contract and payment schedule, see Appendix K.

Attendance, Posttest, Debriefing and Incentive Drawing Procedures

Subject attendance was monitored through sign-in sheets. For a sample sign-in sheet, see Appendix L. Those individuals who did not attend at least three sessions were omitted from data analysis. The final class session was used to review course information, administer the posttest, provide debriefing,

and select the incentive prize winner. The posttest, which was identical to the pretest, was administered. Individuals were asked to respond to the statements, "I am currently not exercising" and "I plan to exercise in the next six months." The investigator clearly stated that to be "currently exercising," the participant must have initiated an exercise program outside of the class meeting. After the posttest, individuals were debriefed on the intent of the study. Individuals were told the following information:

1. There are many ways to learn how to begin exercising. They should seek to educate themselves on what is the right method for them.

2. They have been participating in a project designed to determine what methods are most appropriate for Hispanic individuals.

3. Individuals were told that they received one intervention designed for exercise motivation and that there were other sites who received a different intervention. A brief explanation of the other intervention was given.

4. Individuals were given a variety of documents prepared by the American Heart Association (in Spanish and English) on starting and maintaining an exercise program. See Appendix M for a list of publications available from the American Heart Association applicable to the Hispanic population.

For each site, those individuals who attended all sessions were entered into a drawing for the chance to win $20. This promoted class attendance and

reduced subject attrition for all interventions.

Organization and Treatment of the Data

Data analyses included descriptive and inferential techniques. All individuals were given a code number so that strict confidentiality could be maintained. Only subjects attending at least three classes of the intervention were included for data analysis. Raw data from the Subject Data Form were organized for computerization. The Subject Data Form was comprised of questions yielding two types of data: numerical and categorical. The numerical data came from questions concerning age, length of residence in the United States, and self-efficacy scores. The categorical data came from questions that required selection from a category of responses. This data regarded gender, ethnicity, highest level of education, and stage of change score at pretest and posttest (i.e., contemplation, preparation). To convert the True or False responses into usable form, all questions requiring a True or False were given a score of 1 or 2, respectively. All individuals used in data analysis were in the contemplation stage of exercise behavior at pretest. The posttest data yielded information about whether subjects moved from a contemplation to a preparation stage of exercise behavior or remained a contemplator. For example, a subject who is a contemplator would answer True to the question, "I do not currently exercise, but I intend to in the future."

The same subject that moved into the preparation stage at posttest would answer True to the question, "I am currently participating in an exercise program and I intend to exercise in the future." Those subjects that did not change exercise behavior from pretest to posttest, would answer True to the question, "I do not currently exercise, but I intend to in the future." The same subject that did not move into the preparation stage at posttest would answer True to the question, "I am not currently participating in an exercise program, but I intend to exercise in the future." The contemplation stage and the preparation stage were coded as a 1 or 2, respectively for posttest data.

Demographic descriptions of each group and the total sample (the standard and tailored groups) were reported with descriptive statistics. Descriptive statistics for the dependent variables included mean, standard deviation, frequencies, and percentages.

The research question considered if the amount of progress in an exercise program was a function of treatment (i.e., standard or tailored approach to exercise behavior change). An ANCOVA was used to determine if there was a significant difference on posttest scores between the standard group and the tailored group. Using pretest scores as a covariate ANCOVA was calculated to determine differences in posttest means. The pretest self-efficacy score was used as a covariate in an ANCOVA analysis. A Stuart-Maxwell test for correlated proportions was used to show differences

from pretest to posttest and between groups for stage of change score. The alpha level was set at a significance of <.05.

Summary

Hispanic subjects for this pretest/posttest experimental study were recruited from The Organization for Latin Americans, The Brady Center, East Dallas Health Center, Bluitt-Flowers Health Center, and Dallas SER-Jobs for Progress Program. Subjects were age 18 to 65 years. Only those subjects identified as contemplators were used for data analysis. Groups were then randomly assigned the standard or tailored intervention. Both interventions consisted of one hour weekly sessions for five weeks. Differences between groups on stage of change score and self-efficacy were tested before and after treatment.

CHAPTER IV

FINDINGS

The purpose of the study was to determine the effectiveness of an intervention based on the Exercise Stages of Change model in increasing the self-reported physical activity and exercise self-efficacy of currently sedentary Hispanics who are interested in starting an exercise program. Only those subjects identified as contemplators were used in the data analysis. Contemplators are those individuals who self-report seriously intending to change their behavior within the next six months. The findings are presented under the following headings: (a) Characteristics of Subjects, (b) Differences in Stage of Change Score Among Groups, (c) Differences in Exercise Self-Efficacy Scores Among Groups, and (d) Summary.

Characteristics of the Subjects

Data were collected on a total of 11 variables for the subjects, which included gender, age, ethnicity, education level, acculturation status, pre and posttest exercise stage of change score, pre and posttest exercise self-efficacy scores, and pre and posttest total self-efficacy scores. These statistics are presented in Tables 1 and 2.

Statistics on age, acculturation status, exercise self-efficacy (pre and

posttest), total self-efficacy (pre and posttest) are presented in Table 1. There were 57 subjects randomly assigned to the tailored intervention ($\underline{n}$ = 27) or the standard intervention ($\underline{n}$ = 28) by site of recruitment. These individuals were self-described as presently not participating in an exercise or activity program, but intended to in the future. Using a BMDP3D (Dixon, 1987) computer program, a test of significance was run to determine if there were differences in subjects in the tailored group and the standard group on pretest. For exercise self-efficacy pretest score, the tailored and standard intervention groups were not significantly different, F(1, 54) = -.15, $\underline{p}$ = .89. The tailored and standard intervention subjects were not significantly different, $\underline{F}$(1, 54) = -.19, $\underline{p}$ = .85, on the total self-efficacy pretest score.

Table 1 reveals that subjects in the tailored group ranged in age from 23 to 61 years with a mean age of 35.48 years. The standard group subjects had a mean age of 30.25 years, with a range of 18 to 77 years.

Further inspection of Table 1 indicates that the Tailored group had an Acculturation Status of 11.51 years, with a range of 1 to 61 years. However, the Standard group subjects had an Acculturation Status of 7.39 years, with a range of 1 to 21 years.

Regarding pretest exercise self-efficacy scores, the tailored group had a range of 14 to 87%, with a mean of 45.65%. The standard group subjects

Table 1

Descriptive Statistics for the Variables by Group

Variables	Range	$\underline{M}$	$\underline{SD}$	$\underline{SEM}$
Age in Years				
Tailored	38 (23-61)	35.48	9.51	1.76
Standard	59 (18-77)	30.25	11.60	2.19
Acculturation Status (Years)				
Tailored	60 (1-61)	11.51	11.65	2.16
Standard	20 (1-21)	7.39	5.85	1.10
Exercise Self-Efficacy (Pretest)				
Tailored	73 (14-87)	45.65	23.90	4.43
Standard	70 (11-81)	47.53	22.31	4.21

Table 1, continued

Variables	Range	M	SD	SEM
Exercise Self-Efficacy (Posttest)				
Tailored	81 (13-94)	66.17	15.49	2.87
Standard	87 (10-97)	55.28	20.63	3.89
Total Self-Efficacy (Pretest)				
Tailored	90 (10-100)	65.86	27.71	5.14
Standard	90 (10-100)	68.57	28.08	5.30
Total Self-Efficacy (Posttest)				
Tailored	90 (10-100)	77.96	20.37	3.78
Standard	90 (10-100)	70.32	23.99	4.53

Note. Tailored (n = 29), Standard (n = 28), Total Group (N = 57).

ranged in self-efficacy scores of 11 to 81%, with a mean of 47.53%. On posttest self-efficacy scores were 66.17%, with a range of 13 to 94%, and 55.28%, with a range of 10 to 97%, for the tailored and standard groups, respectively.

Pretest total self-efficacy scores were 65.86% and 68.57% for the tailored group and standard group, respectively. Ranges were from 10 to 100% for both groups on the same variable. Table 1 also reveals that posttest total self-efficacy scores were 77.96% for the tailored group and 70.32 for the standard group, with ranges of 10 to 100% for both groups.

In summary, descriptive statistics were reported on six variables in Table 1. The treatment (i.e., tailored or standard intervention) was considered the independent variable, while Exercise Stage of Change, pre and posttest self-efficacy score and pre and posttest total self-efficacy scores were considered dependent variables. These variables will be discussed later in additional statistical procedures.

Table 2 considers the following variables: gender, ethnicity, education level, and pre and posttest exercise stage of change score. According to Table 2, 82.8% were female and 17.2% were male in the tailored group; however, of the standard group, 78.6% were female, and 21.4% were male. The tailored group consisted of Mexican-Americans (89.7%) and Central-Americans

Table 2

Descriptive Statistics for Selected Variables for Tailored and Standard Groups

Variable/Group	Frequency	%
Gender		
Tailored		
Male	5	17.2
Female	24	82.8
Standard		
Male	6	21.4
Female	22	78.6

Table 2, continued

Variable/Group	Frequency	%
Ethnicity		
Tailored		
Mexican-American	26	89.7
Central-American	3	
Standard		
Mexican-American	23	82.1
Cuban	1	3.6
Central American	4	14.3

Table 2, continued

Variable/Group	Frequency	%
Education level		
Tailored		
Some grade school	21	72.4
High school diploma	5	17.2
Some college	3	10.3
Standard		
Some grade school	13	46.4
High school diploma	5	17.9
Some college	5	17.9
College degree	3	10.7
Graduate Degree	2	7.1

Note. Tailored Group ($\underline{n}$ = 29), Standard Group ($\underline{n}$ = 28).

(10.3%), while the standard group consisted of Mexican-Americans (82.1%), Central-Americans (14.35%), and Cubans (3.6%). Regarding education level, the tailored group consisted of subjects who had some grade school (72.4%), a high school diploma (17.2%), or some college (10.3%). The standard group had some grade school (46.4%), a high school diploma (17.9%), or some college (17.9%), a college degree (10.7%), or a graduate degree (7.1%).

Differences in Exercise Stage of Change Scores Among Groups

A comparison of the Exercise Stage of Change scores for both the tailored and standard groups was done by the Stuart-Maxwell Test for Correlated Proportions (Fleiss, 1981). This test of proportions indicated that the tailored intervention subjects were significantly more active after the intervention than the standard intervention subjects.

Table 3 shows the results of findings pertaining to change in exercise status after the treatment intervention. For the tailored group, 97% ($\underline{n}$ = 28) of those reporting no exercise prior to the intervention became active during the intervention. Approximately 68% ($\underline{n}$ = 19) of those in the standard treatment became more active during the intervention. Therefore, the effect size is 29 points. The observed effect was significant at $\underline{p}$ < .001, tested at the alpha 2-tailed level of .05.

Table 3

Number and Percentages of Subjects Reporting Change in Exercise Status
After Tailored and Standard Interventions

Variable	n	%
Reported Change in Exercise Status After Intervention		
Tailored	28	97
Standard	19	68
Reported No Change in Exercise Status After Intervention		
Tailored	1	3
Standard	9	32

Note. Tailored group (n = 29), Standard group (n = 28).

Differences in Exercise Self-Efficacy Scores Among Groups

An independent t-test on exercise self-efficacy scores indicated that the tailored groups had a significantly higher posttest self-efficacy score than the standard groups. Table 4 indicates a significant difference in the tailored ($\underline{M}$ = 68.07) and standard ($\underline{M}$ = 55.28) groups with respect to posttest Exercise Self-Efficacy scores, $\underline{t}(54)$ = 2.84, $\underline{p}$ = .006. Subject 1 from the tailored group was omitted as an outlier.

Table 5 indicates there was not a significant difference between adjusted posttest means of the two groups. In this analysis, total self-efficacy posttest scores were used as a covariate.

Summary

The purpose of the study was to determine the effectiveness of an intervention based on the Exercise Stages of Change model in increasing the self-reported physical activity and exercise self-efficacy of currently sedentary Hispanics who are interested in starting an exercise program. Only those subjects identified as contemplators were used in the data analysis.

The data analysis revealed that there was a significant proportion of subjects who changed from the contemplation stage of change to the preparation stage of change at post intervention. In addition, the analysis revealed that although both groups were not significantly different on pretest

Table 4

Independent T-test on Posttest Self-Efficacy Scores for Tailored and Standard Groups

Group	M	t	p
Tailored	68.07		
		2.84	.006
Standard	55.28		

Note. Subject 1 of the tailored group was omitted as an outlier. Tailored group (n = 28), standard group (n = 28).

Table 5

Analysis of Covariance Summary Table

Source of Variation	df	SS	MS	F	p
Between groups	1	1510.12	1510.12	3.94	.052
Error	53	20330.49	383.59		

Note. $N = 56$. Subject 8 of the tailored group was omitted as an outlier.

exercise self-efficacy, the tailored group had a significantly higher posttest score on exercise self-efficacy than the standard group.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND

RECOMMENDATIONS FOR FURTHER RESEARCH

This chapter presents a summary of the study, a discussion of the findings, and conclusions. Observations regarding research methodology with Hispanic populations and recommendations for future studies will be discussed.

Summary

The purpose of the study was to determine the effectiveness of an intervention based on the Exercise Stages of Change model in increasing the self-reported physical activity and exercise self-efficacy of currently sedentary Hispanics who were interested in starting an exercise program. The research question considered if the amount of progress in an exercise program was a function of treatment intervention.

There were 57 subjects randomly assigned to the tailored intervention (n = 27) or the standard intervention (n = 28) by site of recruitment. These individuals were self-described as presently not participating in an exercise or activity program, but intended to in the future. Data were collected on a total of 11 variables for the subjects, which included gender, age, ethnicity, education level, acculturation status, pre and posttest exercise stage of change

score, pre and posttest exercise self-efficacy scores, and pre and posttest total self-efficacy scores. Data were gathered using a Subject Data Form, which included demographic information, cardiovascular health risk factors, exercise habits, and exercise self-efficacy.

Subjects in the tailored intervention ranged in age from 23 to 61 years ($\underline{M}$ = 35.48 years), whereas, the standard group subjects had a mean age of 30.25 years, with a range of 18 to 77 years. For purposes of the study, the population was delimited to Hispanics who met the following criteria: (a) self-identified as Hispanic, (b) at least age 18 to 65 years, and (c) apparently healthy or approval of physician if high risk or with heart disease.

Conclusion

The two hypotheses of the study were: (a) there is no difference in exercise self-efficacy between subjects in the tailored-treatment intervention (tailored) and the standard-treatment intervention (standard) on posttest and (b) there is no difference in proportion of subjects in the preparation stage between the standard group and the tailored group at posttest. A Stuart-Maxwell Test for Correlated Proportions indicated that there was a significant difference in the number of subjects moving from a contemplation stage to a preparation stage at the end of treatment. An independent t-test indicated that there was a significant difference in the posttest exercise self-efficacy

scores of the tailored group when compared to the standard group. Therefore, both hypotheses were rejected.

Discussion

In the review of literature, there have been no studies identified that examine the Exercise Stages of Change Model and its value to Hispanic populations. The findings in the present study, although not generalizable to the full population, suggest that this model is a viable tool for health educators. Although exercise behavior change is a complex issue, several variables examined in the present study may provide a better understanding of the results.

With regard to the differences found in the standard and tailored groups on pre and post exercise stage of change scores, several intervening variables should be discussed. The tailored group had lived in the U.S. longer ($\underline{M}$ = 11.51 years) than the standard group ($\underline{M}$ = 7.39 years). This length of residence might provide for a better understanding of the English language, higher self-efficacy, and a more clear understanding of the relationship between physical activity and health. Also, the standard group had a higher overall education level than the tailored group (i.e., more college experience and graduate degrees). A more educated individual might be more selective and wary of suggested health behavior changes and not so ready to change. In

addition, family support may have played a role in the dynamics of the behavior change. Many of the sites were chosen because of their accessibility of Hispanics and willingness of the Executive Directors to work with the investigator. Classes were either currently in place (i.e., English-as-a-Second-Language classes or support groups) or formed by the investigator. English-as-a-Second-Language classes were formal meetings and many times the intervention was administered at the beginning or end of the class session. Two of the three tailored approach classes had children in attendance. However, in only one of the two standard intervention classes were family members often present. The instructor did not dictate to classes if family members could attend, as it was neither encouraged nor discouraged.

In addition, there was no significant difference found for the posttest total self-efficacy scores between the tailored and standard subjects yet differences were found in the averaged exercise self-efficacy scores. A possible explanation for this discrepancy is that many Hispanic subjects may have had difficulty in understanding the phrase, "In general, I believe I could exercise at my target heart rate three to five times per week for 30 to 40 minutes over the next 6 months." This statement may be too broad for application to personal experience. The first 15 items of the exercise self-efficacy scale were designed to measure self-efficacy in specific situations, and thus might may have been

easier for the subjects to recall.

Observations Regarding Research with Hispanics

The following is a discussion about observations regarding methodological issues involved in research with Hispanics in this study.

During the five-week intervention, several observations were made that might improve the understanding of health professionals when conducting research with Hispanic populations. The more that is known about barriers to Hispanic research, the more likely future research project, similar to this one, will occur.

Marin & Marin (1991) indicated that "certain cultures in the United States are considered future-oriented due to their emphasis on planning for the future. In contrast, present-oriented societies are often described as unable to delay gratification or to plan for the future and as inefficient and not punctual" (p. 16). In the present investigation, classes usually did not begin until 15 minutes after the scheduled time. Although once in attendance, the subjects took the subject matter very seriously. Future researchers with Hispanic subjects should accommodate this different time orientation into the procedures so that the research process continues smoothly.

Moore (1970) described the value of family to Hispanics. In the present investigation, it was not uncommon for children, husbands, mothers, and other

extended family members to attend class with subjects. During the investigation process, the children would mimic what their mother was doing (i.e., stretching, deep breathing, walking, etc.). The investigator also noticed that the women were dressing their children in exercise clothing by the end of the intervention.

The Hispanics in the present study had difficulty understanding the question, "I am currently not exercising." The word "not" seemed to provide confusion as to whether the answer would be true or false. Many subjects found it difficult to understand why they would answer true if they were not exercising. In addition, it is important for the researcher to understand that not all English phrases have a direct translation in meaning or context. For example, the words "target heart rate," or "hectic" were not readily understood until explained in depth. This underscores the importance of having all materials translated by an individual that is educated in the language, but who also possesses the cultural sensitivity to translate for a specific groups of Hispanics (e.g., low-income vs. high-income).

Perhaps the most important aspect of conducting research with Hispanic populations is to identify key individuals within an organization who will promote the project. Often referred to as "gatekeepers," these individuals must be: (a) respected by the population sought, (b) similar in physical characteristics (i.e., ethnicity, language skills, professional affiliation, etc.) to

the intended population, and (c) a natural part of the organizational structure.

Recommendations for Further Study

Recommendations for further study in the area of Exercise Stages of Change Model and Hispanic populations are as follows:

1. Conduct a larger pilot study of the Exercise Stage of Change instrument and the Exercise Self-Efficacy Scale to Hispanics of various socioeconomic and education levels.

2. Design a modified version of the Exercise Stages of Change Questionnaire. For example, the participants could answer the open-ended question, "List all the physical activities you have done in the past six weeks" or answer true or false to the question, "I am currently exercising and intend to exercise in the future." Or, use the individual interview process to obtain pretest and posttest data.

3. Design a shorter, less overwhelming version of the Exercise Self-Efficacy Scale specifically tailored for the Hispanic population and situations prominent in their culture and relevant to their socioeconomic status.

4. Compare the effects of acculturation status on behavior change. Cuellar, Harris, and Jasso (1980) designed a questionnaire that assesses the cultural status of Mexican-Americans.

5. Investigate the role of the family in the dynamics of health behavior change among Hispanics.

References

American College of Sports Medicine. (1992). <u>Guidelines for exercise testing and prescription</u>. (4th ed.). Philadelphia, PA: Lea & Febiger.

American Heart Association. (1992). Statement on exercise: Benefits and recommendations for physical activity programs for all Americans. <u>Circulation, 36</u>, 340-344.

Baranowski, T. (1992). <u>Health behavior research in minority populations: Access, design, and implementation.</u> (DHHS Publication No. 92-2965). Washington, DC: U.S. Government Printing Office.

Blair, S. N. (1991). <u>Living with exercise</u>. Dallas, TX: American Health Publishing.

Blair, S. N., Chandler, J. V., Ellisor, D. B., & Langley, T. (1980). Improving physical fitness by exercise training programs. <u>Southern Medical Journal, 73</u>(12), 1594-1596.

Blair, S., Kohl, H., & Barlow, C. (1993). Physical activity, physical fitness, and all-cause mortality in women: Do women need to be active? <u>Journal of the American College of Nutrition, 12</u>(4), 1-4.

Booth, M. L., Macaskill, P., Owen, N., Oldenbur, B., Marcus, B., & Bauman, A. (1993). Population prevalence and correlates of stages of change in physical activity. <u>Health Education Quarterly, 20</u>(3), 431-440.

Cousins, J. H., Rubovits, D. S., Dunn, J. K., Reeves, R. S., Ramirez, A. G., & Foreyt, J. P. (1992). Family versus individually oriented intervention for weight loss in Mexican-American women. <u>Public Health Reports, 107</u>(5), 549-555.

Cresce, A. R., Lapham, S. J., & Rolark, S. J. (1992, August). <u>Preliminary evaluation of data from the race and ethnic origin questions in the 1990 census</u>. Paper presented at the annual meeting of the American Statistical Association, Boston, MA.

Cuellar, I., Harris, L., & Jasso, R. (1980). An acculturation scale for Mexican-American normal and clinical populations. Hispanic Journal of Behavioral Sciences, 2(3), 199-217.

DeBusk, R., Stenestrand, U., Sheehan, M., & Haskell, W. (1990). Training effects of long versus short bouts of exercise in healthy subjects. The American Journal of Cardiology, 65, 1010-1013.

Dixon, W. J. (1987). BMDP statistical software. Berkeley: University of California Press.

Duncan, J., Gordon, N., & Scott, C. (1991). Women walking for health and fitness: How much is enough? Journal of the American Medical Association, 266(23), 3295-2399.

Exercising options: Study says moderate, intermittent activity as good as nonstop workout. (1993, July). The Dallas Morning News, p. 12A.

Farrell, S., Kohl, H., & Rogers, T. (1987). The independent effect of ethnicity on cardiovascular fitness. Human Biology, 59(40, 657-666.

Federal Register. (1978, May 4). Washington, DC: Government Printing Office.

Fleiss, J. (1981). Statistical methods for rates and proportions. New York: John Wiley & Sons.

Garcia, A. W., & King, A. C. (1991). Predicting long-term adherence to aerobic exercise: A comparison of two models. Journal of Sport and Exercise Physiology, 13, 394-410.

Hahn, R. A., & Stroup, D. F. (1994). Race and ethnicity in public health surveillance: Criteria for the scientific use of social categories. Public Health Reports, 109(1), 7-15.

Kumanyika, S., & Golden, P. (1991). Cross-sectional differences in health status in U.S. racial/ethnic minority groups: Potential influences of temporal changes, diseases, and life-style transitions. Ethnicity and Disease, 1, 50-59.

Marcus, B. H., Banspach, S. W., Lefebvre, R. C., Rossi, J. S., Carleton, R. A., & Abrams, D. B. (1992). Using the stages of change model to increase the adoption of physical activity among community participants. American Journal of Health Promotion, 6(6), 424-429.

Marcus, B. H., Selby, V. C., Niaura, R. S., & Rossi, J. S. (1992). Self-efficacy and the stages of exercise behavior change. Research Quarterly for Exercise and Sport, 63, 60-66.

Marcus, B. H., & Simkin, L. R. (1993). The stages of exercise behavior. The Journal of Sports Medicine and Physical Fitness, 33(1), 83-88.

Marin, G., & Marin, B. V. (1991). Research with Hispanic populations. London: Sage.

Meyers, C. (1992). Walking: A complete guide to the complete exercise. New York: Random House.

McKenney, N. R., & Bennett, C. E. (1994). Issues regarding data on race and ethnicity: The Census Bureau experience. Public Health Reports, 109(1), 16-25.

Mitchell, B., Hazuda, H., Haffner, S., Patterson, J., & Stern, M. (1991). Myocardial infarction in Mexican-Americans and Non-Hispanic Whites: The San Antonio Heart Study. Circulation, 83, 45-51.

Moore, J. W. (1970). Mexican-Americans. Englewood Ciffs, NJ: Prentice-Hall.

National Cancer Institute. (1991). Atlas of US cancer mortality among nonwhites: 1950-1980 (NIH Publication No. 90-1582). Bethesda, MD: US. Government Printing Office.

Prochaska, J. O. (1993). Working in harmony with how people change naturally. The Weight Control Digest, 3(3), 251-255.

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. American Psychologist, 47, 1102-1114.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and process of self-change in smoking: Towards an integrative model of change. Journal of Consulting and Clinical Psychology, 51, 390-395.

Sedgwick, A., Taplin, R., Davidson, A., & Thomas, D. (1988). Effects of physical activity on risk factors for coronary heart disease in previously sedentary women: A five-year longitudinal study. Australian New Zealand Journal of Medicine, 18, 600-605.

Stern, M., Bradshaw, B., Eifler, C., Fong, D., Hazuda, H., & Rosenthal, M. (1987). Secular decline in death rates due to ischemic heart disease in Mexican Americans and Non-Hispanic whites in Texas, 1970-1980. Circulation, 76(6), 1245-1250.

U.S. Department of Health and Human Services. (1990). Healthy people 2000: National health promotion and disease prevention objectives (DHHS Publication No. PHS 91-50213). Washington, DC: U.S. Government Printing Office.

U.S. Departmnet of Health and Human Services. (1992, May). Improving minority health statistics. Washington, DC: U.S. Governmnet Printing Office.

Williams, D. R., Lavizzo-Mourney, R., & Warren, R. C. (1994). The concept of race and health status in America. Public Health Reports, 109(1), 26-41.

Young, D. R., & Steinhardt, M. A. (1993). The importance of physical fitness versus physical activity for coronary artery disease risk factors: A cross-sectional analysis. Research Quarterly for Exercise and Sport, 64(4), 377-384.

APPENDICES

APPENDIX A

SAMPLE ADVERTISEMENT FLIER

APPENDIX A

SAMPLE ADVERTISEMENT FLIER

Celebration of Heart Health

A Hispanic Heart Health
Program

For those who do not exercise on a regular basis, but would like to become more active!

The Bluitt-Flowers Health Center is offering a free 5 week program on taking care of your heart with exercise! Those attending four sessions will get a chance to win $20. The classes will be on:

Wednesdays, August 3, 10, 17, and 24, 6 - 7 p.m., Conference Center <u>OR</u>

Wednesdays, August 3, 10, 17, and 24, 10:30 - 11:30 a.m., Conference Center

This is what you will learn:

♥How to stretch and start a walking program   ♥How to exercise so that it does not hurt

♥How to maintain your exercise program   ♥How to set goals and stick to your program

♥And more!

To register for the class contact _____at the reception desk at Bluitt-Flowers Health Center, _____. Classes will be taught in English and Spanish.

APPENDIX B

PERMISSION LETTER

APPENDIX B

PERMISSION LETTER

TEXAS WOMAN'S UNIVERSITY
DENTON/DALLAS/HOUSTON

HUMAN SUBJECTS REVIEW COMMITTEE

April 1, 1994

OFFICE OF
RESEARCH AND
GRANTS ADMINISTRATION
P.O. Box 22939
Denton, TX 76204-0939
Phone: 817/898-3375

Beverly Tremain
1716 Lincoln Drive
Wylie, Tx 75098

Dear Beverly Tremain:

Your study entitled "Exercise Stages of Change Among Hispanics" has been reviewed by a committee of the Human Subjects Review Committee and appears to meet our requirements in regard to protection of individuals' rights.

Be reminded that both the University and the Department of Health and Human Services (HHS) regulations typically require that agency approval letters and signatures indicating informed consent be obtained from all human subjects in your study. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to HHS regulations, another review by the Committee is required if your project changes.

Special provisions pertaining to your study are noted below:

____ The filing of signatures of subjects with the Human Subjects Review Committee is not required.

____ Other:

__X__ No special provisions apply.

Sincerely,

Chairman
Human Subjects Review Committee

cc: Graduate School
Dr. Judy Baker, Health Studies
Dr. William Cissell, Health Studies

A Comprehensive Public University Primarily for Women
An Equal Opportunity/Affirmative Action Employer

APPENDIX C

SUBJECT CONSENT TO PARTICIPATE IN RESEARCH

APPENDIX C
TEXAS WOMAN'S UNIVERSITY
SUBJECT CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Exercise Stages of Change Among Hispanics

Investigator: Beverly Tremain

The purpose of this research project is to understand the exercise behavior of Hispanics and its role in preventing heart disease. I understand that I will be expected to attend four meetings of approximately 1 hour in duration. In addition, I will be asked to complete three questionnaires before and after the four meetings: one about my health, two about my exercise attitudes. I will also be asked information about ethnicity, how long I have lived in the United States, and whether I prefer to speak English or Spanish. During the four-week intervention, the instructor will give me information concerning exercise and heart disease. The meetings are intended to help me with creating my own exercise program and to increase my awareness about the role of exercise in preventing heart disease.

The risks involved in this study are minimal. Possible risks involve public embarrassment of releasing my personal health history to strangers. I understand that every attempt will be made to ensure that data are seen only by the researcher. The investigator will insist to other course participants that all information revealed during the intervention not be relayed to anyone outside the group. My name will be coded and this code will be matched to all of my written information given before and after the intervention. My name will not be associated with any personal data. All written information used in this study will kept in a locked safe for two years following the study. After two years, all written information will be shredded and destroyed. Although a trained, credentialed professional in the field of physical education will be teaching the course, there always exists risks when beginning an exercise program. There exists the remote possibility of abnormal blood pressure, fainting, disorders of heart rhythm, and in very rare instances of heart attack and even death. However, careful screening of risk factors before inclusion in the study and/or written permission by my physician to participate in the study will lower personal risks.

APPENDIX C, CONTINUED

I understand that a doctor or nurse will not review my health risks and will never be present at any time during or after the classes. However, the instructor is a trained CPR instructor should an emergency arise. Throughout the course, I will also be asked about my exercise attempts outside of class and if any complications or problems are occurring I will be encouraged to discuss them.

The benefits to be derived from this study are that I may learn more about exercise and the role it plays in preventing heart disease. Also, I understand that if I attend all four meetings, my name will be placed into a drawing to possibly win a monetary incentive of $20. I may also learn more about heart disease, causes, and prevention measures. I will also receive benefits from participating in a class that has a supportive environment as I learn more about my own health and ways that I can improve it through exercise. I will be given information on my readiness for exercise and exercise self-efficacy and materials that will help me to start and maintain my own exercise program. The researcher will also be available to answer questions after the focus group meeting about general health and exercise. English/Spanish literature on cardiovascular disease will be available for participants.

The 4-week intervention will begin with an introduction of the study. I will be given an opportunity at the beginning of the first class to discontinue my participation in the course and ask questions relating to the procedures to be followed. If there are no questions, each subject will sign again the English or Spanish version of the consent form. All participants will be given an English and Spanish version of the consent form, regardless of which one they signed. During the four weeks, I will be expected to participate in group discussion about my exercise attitudes, behaviors, and abilities. Topics to be discussed may include the following: (a) risk factors for heart disease, (b) types of exercises, frequency, intensity, duration appropriate to my level, (c) benefits, barriers and threats to exercising, (d) heart rate measurement during exercise, (e) stretching and walking programs, (f) daily exercise at home and at work. The class will be informally led and I will have full control over what I discuss and reveal about myself. The type of class I will be assigned to will depend upon my level of readiness for exercise.

An offer to answer all of my questions regarding the study has been made and I have been given a copy of the dated and signed consent form. A description of the possible attendance discomfort and risks reasonable to expect have been

APPENDIX C, CONTINUED

discussed with me. I understand that no medical service or compensation will be provided to me by the University as a result of injury from participation in research. I understand that I may terminate my participation in the study at any time. If I have concerns about the way this research has been conducted, I may contact the Texas Woman's University Office of Research and Grants Administration at 817-898-3375.

Subject's Signature   Date

_____   _____

APPENDIX D

SUBJECT DATA FORM

APPENDIX D

SUBJECT DATA FORM

Name_____ Telephone_____

I. I am ___ male ___ female   I am ____ years old

I am:___Mexican-American ___Puerto Rican   ___Cuban

___South-American   ___Central-American   ___Other

Do you understand and speak English? ___ yes   ___ no

My highest level of education is: ___some grade school or high school

___high school diploma ___some college   ___college degree

___some graduate work ___graduate degree

How long have you lived in the U.S.? _____ years

II. Which of the following risk factors for cardiovascular disease do you have?

___high blood pressure   ___High cholesterol

___cigarette smoking   ___diabetes

___family history of coronary disease in parents/siblings prior to age 55.

Yes No   Have you been told by your physician that you have heart trouble?

Yes No   Have you visited your physician about your health within the last
            two years?

Yes No   Are you pregnant or do you think you may be pregnant?

APPENDIX D, CONTINUED

III. Exercise Habits

1. True   False   I currently do not exercise.
2. True   False   I intend to exercise in the next 6 months.
3. True   False   I currently exercise regularly.
4. True   False   I have exercised regularly for the past 6 months.
5. True   False   I have exercised regularly in the past for a period of at least 3 months.

Note. Regularly is defined as exercising at least three times per week in an exercise program for the last six weeks.

IV. Using the scale below as a yardstick, please answer the following: How confident are you that you could exercise under each of the following conditions over the next 6 months?

10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

I could exercise:

a. when tired.   _____%

b. during or following a
   personal crisis.   _____%

c. when feeling depressed.   _____%

d. when feeling anxious.   _____%

e. during bad weather.   _____%

f. when slightly sore from the
   last time I exercised.   _____%

g. when on vacation.   _____%

APPENDIX D, CONTINUED

h. when there are competing
interests (like TV).   _____%

i. when I have a lot of work to do.   _____%

j. when I haven't reached my
exercise goals.   _____%

k. when I don't receive support
from my family or friends   _____%

l. when I have not exercised for a
prolonged period of time   _____%

m. when I have no one to exercise
with.   _____%

n. when my schedule is hectic.   _____%

o. when my exercise workout is
not enjoyable   _____%

In general, I believe I could exercise at my target heart rate three to five times per week for 30 to 40 minutes over the next 6 months. _____%

APPENDIX E

PHYSICIAN CONSENT FORM

APPENDIX E
Physician Consent Form

Dear Physician:

Your Patient, _____, is wishing to enroll in Celebration of Heart Health classes. However, information on their health questionnaire deems it necessary that they receive physician approval before participating. Your patient indicated that they have the following risk factors for heart disease and/or other health problems:

__ high blood pressure

__ smoking

__ diagnosed heart disease

__ family history of heart disease

__ high cholesterol

__ diabetes mellitus

__ pregnant or think they may be pregnant

Celebration of Heart Health is my doctoral dissertation project that I have designed for _____. I am a PhD student in the Health Studies Department at Texas Woman's University. This dissertation has been approved by my department, the Human Subject's Review Committee, and the Graduate Office. The project is a 4-week intervention dedicated to improving the awareness, attitudes, and health behavior of Hispanics in this community. A variety of topics are covered, such as risk factors for heart health, benefits of daily exercise, stretching and walking programs, setting and maintaining goals, and more. The intent of the class is to improve understanding about heart health and not to necessarily lead them through exercise; however, they may wish to start a program when the class is finished.

____ Yes, I am encouraging my patient to take the Celebration of Heart Health Classes. Restrictions/Limitations:_____

_____   _____
Physician's Signature   Date

Address:_____
_____ Phone: _____
Please return to the patient. Please call me if you have any questions about this class, 442-6860.

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APPENDIX F

EXERCISE STAGES OF CHANGE SCORING INSTRUCTIONS

APPENDIX F

EXERCISE STAGES OF CHANGE SCORING INSTRUCTIONS

IF ITEM 1 = TRUE AND ITEM 2 = FALSE, THEN SUBJECT IS IN PRECONTEMPLATION STAGE

IF ITEM 1 = TRUE AND ITEM 2 = TRUE, THEN SUBJECT IS IN CONTEMPLATION STAGE

IF ITEM 1 = FALSE AND ITEM 3 = FALSE, THEN SUBJECT IS IN PREPARATION STAGE

IF ITEM 3 = TRUE AND ITEM 4 = FALSE, THEN SUBJECT IS IN ACTION STAGE

IF ITEM 3 = TRUE AND ITEM 4 = TRUE, THEN SUBJECT IS IN MAINTENANCE STAGE

Note: Items 1 through 4 refer to numbers on Subject Data Form.

APPENDIX G

TAILORED INTERVENTION INSTRUCTOR'S MANUAL

Celebration

of Heart

Health
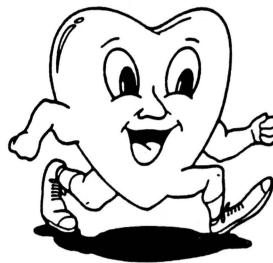
Instructor's Manual
Tailored Intervention
Contemplation Stage

APPENDIX G, CONTINUED

Session 1

I. Cognitive Mapping

    A. List as many words (synonyms) as possible that mean the same thing as exercise. Emphasize the negative and/or positive perceptions that people have of exercise.

    B. Examples

        1. hurts
        2. like to move
        3. don't like to sweat
        4. no time
        5. inconvenient
        6. don't know how to exercise
        7. don't see quick results

    C. Refer to Student Manual for Cognitive Map

II. Humans are designed to move

    A. Discussion of how humans have changed their movement patterns throughout history. Help participants to understand that humans are made to move and that structured programs are not the only way to get movement.

    B. Examples of how early Humans moved:

        1. hunted animals
        2. safety
        3. gathered food
        4. built homes

APPENDIX G, CONTINUED

III. Visualization of movement

A. Participants will close their eyes (music will begin) and imagine themselves moving in any way, shape, or form that they choose. Discuss what they visualized, their relationship with exercise, and why they have this view toward exercise.

B. Materials Needed: tape player, relaxation tapes

IV. Breathing/Stretching Activity

A. Participants will form a small circle and stretch large muscle groups.

B. Materials Needed: large space

Session 2

I. How to Get Moving!

A. List as many simple ways to get movement throughout their days as possible. Attention will be paid to movement possible in the person's home or work environment.

1. walk the dog
2. take a 2-minute walk
3. do yard work
4. play with your children
5. walk to work
6. dance
7. ride a stationary cycle while watching TV
8. go to the zoo

B. Refer to Student Manual for Worksheet

APPENDIX G, CONTINUED

II. Various Effects of Movement:

    A. Psychological

        1. clears your mind
        2. stress reduction
        3. feel good about yourself
        4. meet friends
        5. refreshes the spirit
        6. improved self-concept
        7. relief of depression
        8. improved sleep habits
        9. work improvement

    B. Physical

        1. improves flexibility
        2. stronger heart muscle
        3. reduction in blood pressure
        4. increase good cholesterol, reduce bad cholesterol
        5. don't get tired as easily

III. Breathing/Stretching   Activity

    A. How to stretch on a daily basis

        1. body alignment
        2. hold for 10 seconds
        3. let go
        4. repeat

    B. How to breath on a daily basis

        1. inhale through nose
        2. exhale through mouth
        3. find personal rhythm

APPENDIX G, CONTINUED

Session 3

I. Social Support Systems

    A. Complete social support system. Place a box around those people that support their intentions and a circle around those that try to sabotage it. Strategies for avoiding sabotage will be discussed.

    B. Refer to Social Support Wheel in Student Manual

II. Pleasure Principle Movement (Strategies for Adhering to an Exercise Program)

    A. Feeling and process oriented
    B. Breathing is important in all physical activity
    C. Encouraging individuality and uniqueness of movement
    D. Emphasizing mind, body, and spirit
    E. Deemphasizing "good" or "bad" movements, but instead all movements are beneficial
    F. Deemphasizing numerical values (i.e., weight, body fat) as a benefit of movement
    G. Encouraging the student to development his/her own plan for movement

III. Rewarding Yourself for Becoming More Active

    A. Refer to Student Manual for worksheet

IV. Breathing/Stretching Activity

    A. Materials Needed: tape player and relaxation music

APPENDIX G, CONTINUED

Session 4

I. Breathing/Stretching Activity

    A. Materials Needed: tape player and relaxation music

II. Perceived Exertion:

    A. Scale of Perceived exertion to determine exhaustion to activity.

    B. Refer to Student Manual for scale

III. Barriers to Movement

    A. How will you get exercise when you are:

        1. tired (stretch)
        2. personal crisis (2 minute walk)
        3. bad weather (do something inside)
        4. have a lot of work to do (2-minute walk)
        5. when my schedule is hectic (clears your head)
        6. when sore from last time (take is slowly, stretch)
        7. on vacation (see the sights!)

IV. Goal setting for Life

    A. Set goals

        1. Goal must be your choice (you must want to do it)
        2. Goal must be positive (not negative)
        3. Goal must be specific (measurable)
        4. Goal must be realistic (attainable)

Example: "I will set aside ___ minutes a day, ___ times a week to explore opportunities for movement"

APPENDIX G, CONTINUED

B. What is stopping you from attaining your goal?

    1. lack of knowledge (read, talk to friends, etc.)
    2. lack of skills (you already know how to move)
    3. lack of social support (join a club or class, go to a park)
    4. lack of risk-taking ability (go slow and you only have to please yourself)

C. Process! Process! Process!

    1. You didn't learn to walk in a day, you won't learn to enjoy movement in a day!

    2. Keep trying!

D. Refer to Student Manual for Goal Sheet

V. Group discussion about what was learned

A. Posttest will be administered

B. Debriefing will begin

C. Incentive drawing

APPENDIX H

STUDENT CLASS MANUAL FOR TAILORED INTERVENTION

STUDENT CLASS MANUAL FOR TAILORED INTERVENTION

Celebration

of Heart

Health

Name_____

APPENDIX H, CONTINUED

What does Exercise Mean To You?

Exercise
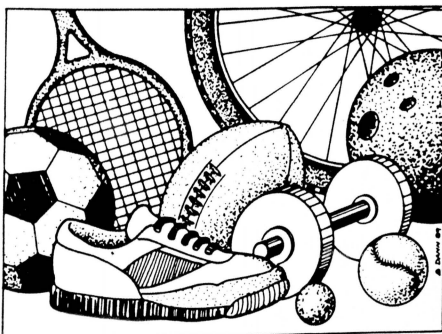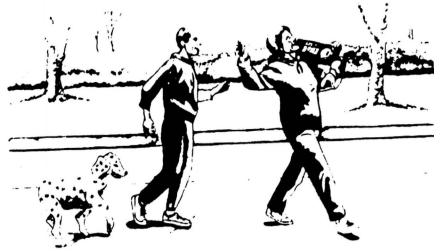
APPENDIX H, CONTINUED

How to Get More Movement into Your Day

_____

_____

_____

_____

_____
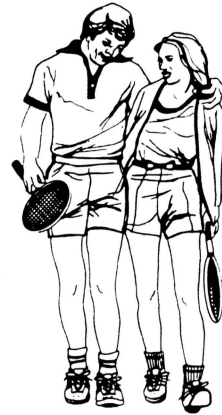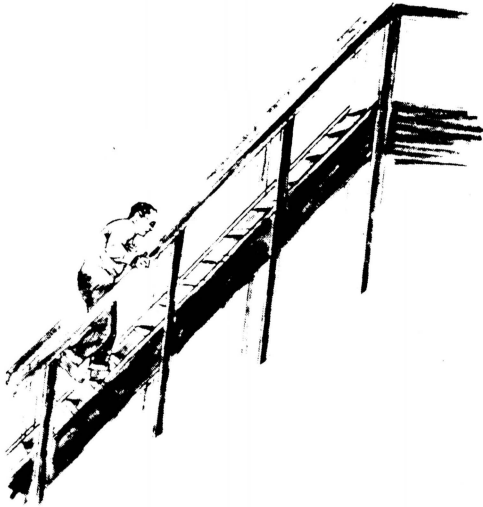
Your Social Support System

Write the names of your friends, family, and coworkers in the circles below. When individuals make behavior changes, those close to him or her could have an impact on their success. For the people that could possibly hinder your attempts to exercise, color their circle red. For the people that will support and help you to start and continue and exercise program, color their circle blue.

You
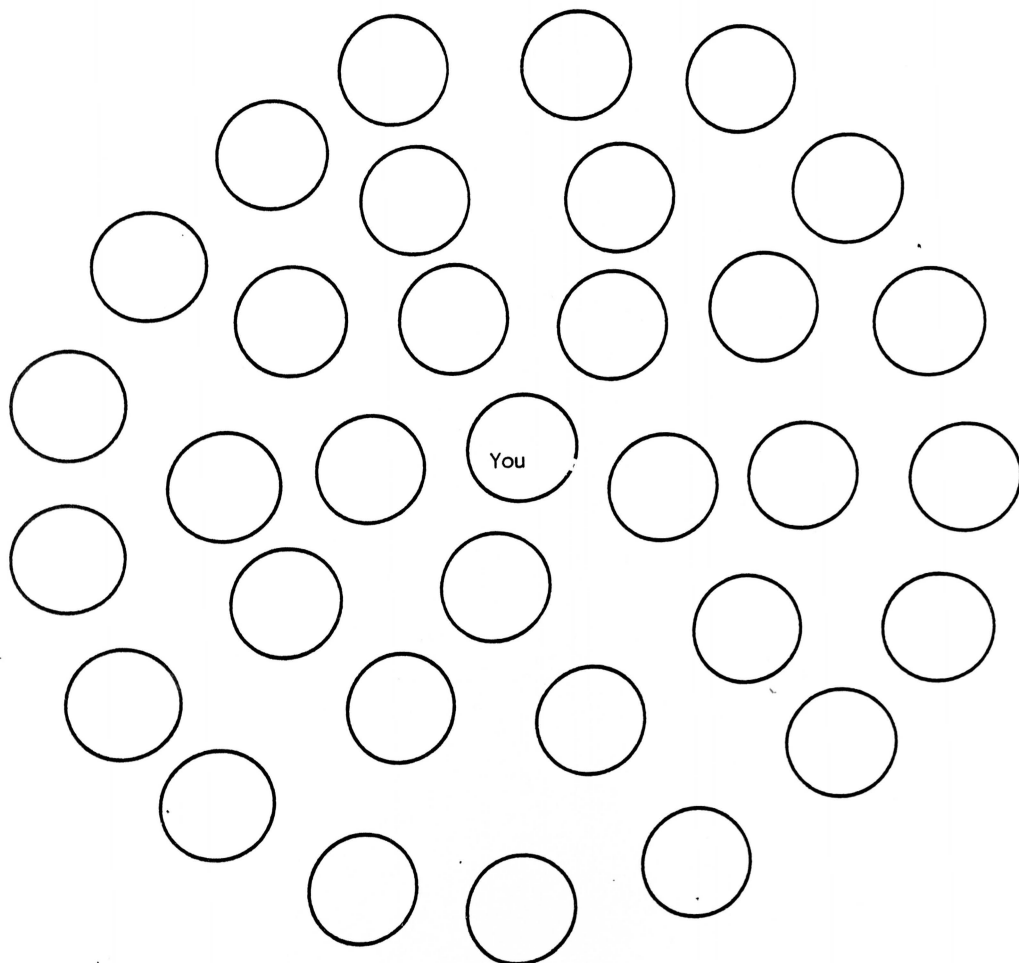
APPENDIX H, CONTINUED

How to Reward Myself for Making Progress or Completing My Goals

_____

_____

_____

_____

_____

Perceived Exertion for Physical Activity

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

LIGHT   MODERATE   HARD

What Keeps Me From Exercising?

_____

_____

_____

_____

Is this what you mean by heart exercise?

© 1989 PARLAY INTERNATIONAL
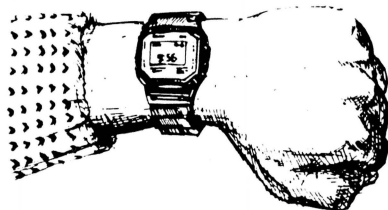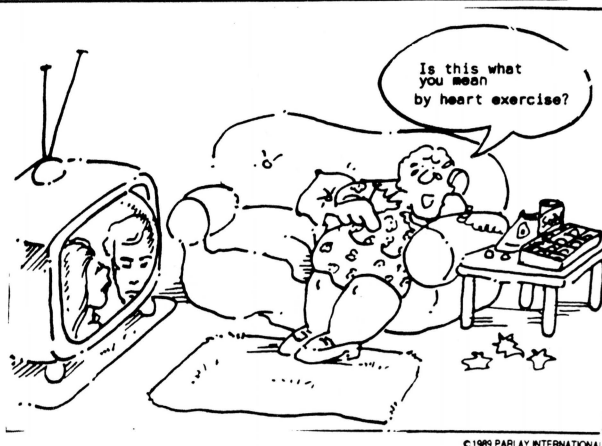
Exercise Goals for Life

_____

_____

APPENDIX H, CONTINUED

NOTES

_____

_____

_____

_____

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APPENDIX I

STANDARD INTERVENTION INSTRUCTOR'S

MANUAL

Celebration

of Heart
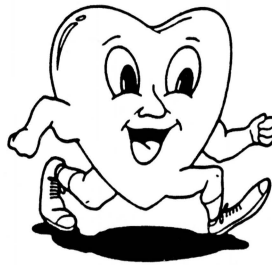
Health

Instructor's Manual
Standard Intervention

APPENDIX I, CONTINUED

The standard approach to exercise prescription is highly structured and closely follows the guidelines of the American College of Sports Medicine. Although it can be beneficial for those individuals in the action, maintenance, and termination stages, it can be too structured, regimented, and painful for those that are simply not ready for such intensity.

Session 1

I. Major Risk Factors of Cardiovascular Disease

    A. Inactivity
    B. High Cholesterol/Poor Nutrition
    C. High Blood pressure
    D. Diabetes
    E. Smoking
    F. Obesity
    G. Family History

    H. Refer to Student Manual for diagrams

II. Fitness/Health Measurement (Home assignment)

    A. Weight
    B. Resting Heart Rate
    C. Refer to Student Manual for Data Sheet

III. Exercise Logs

    A. Student keeps a log of all activity

    B. Refer to Student Manual for Training Log

IV. Light Stretching Activity

APPENDIX I, CONTINUED

Session 2

I. Fitness/Health Measurement (In class)

    A. Blood pressure
    B. Resting Heart Rate

II. Norms

    A. Blood pressure
    B. Weight
    C. Resting heart rate
    D. Values will be discussed and participants will be placed into a "category" based upon their values (if known)
    E. Refer to Student Manual for Norms

III. Physiological Benefits of Cardiovascular conditioning

    A. Circulation
    B. Heart pumps more blood
    C. Greater chance of surviving a heart attack
    D. Increase lifespan
    E. Lower heart rate
    F. Handle stress better
    G. Reduced blood pressure
    H. Reduced cholesterol

        1. increase "happy" cholesterol
        2. decrease "lousy" cholesterol

IV. Light Stretching Activity

APPENDIX I, CONTINUED

Session 3

I. FIT formula for Exercise Prescription

    A. Frequency: how many exercise sessions per week

    B. Intensity: how hard you exercise each session

    C. Duration (time): how long each exercise session is

    D. Modality: Aerobic Exercise

    E. Emphasis will be placed on staying in a structured program with frequency, intensity, and duration. Participants will be instructed that keeping heart rate up is necessary for benefits.

II. Light Stretching Activity

III. Exercise Prescription

    A. Refer to Student Manual for Sample Walking Programs

IV. Taking your pulse

    A. Calculate resting

    B. Karvonen Formula

    C. Refer to Student Manual for Formula Worksheet

V. Light stretching activity

    A. Take pulse

APPENDIX I, CONTINUED

Session 4

I. How to progress and setting short-term goals and long-term goals

    A. Emphasize increases in frequency, intensity, and duration for the next year.

    B. Never increase intensity by more than 10%

    C. Refer to Student Manual for goal worksheet

II. How to stretch and walk

    A. Biomechanics of stretching and brisk walking

    B. Refer to Student Manual for diagram of walking

III. Group discussion about what was learned

    A. Posttest
    B. Debriefing
    C. Incentive Drawing

APPENDIX J

STUDENT CLASS MANUAL FOR STANDARD INTERVENTION

STUDENT CLASS MANUAL FOR STANDARD INTERVENTION

Celebration

of Heart

Health
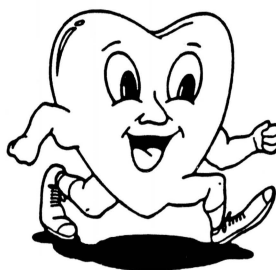
Name_____

APPENDIX J, CONTINUED

Major Risk Factors for Cardiovascular Disease

High blood pressure

High Cholesterol
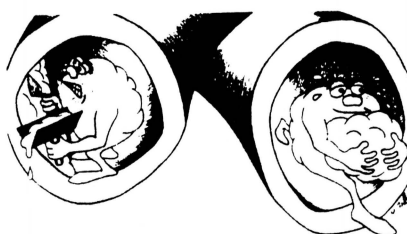
Smoking

Diabetes
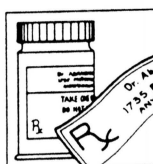
Inactivity

Stress

Obesity

My Physical Measurements

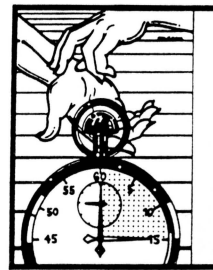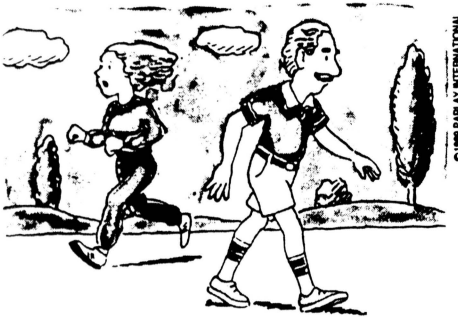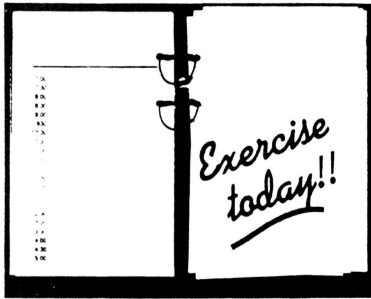Resting Heart Rate:_____

Blood Pressure: _____

Weight:_____
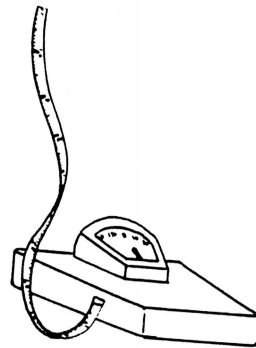
How to Take My Pulse

Place two fingers on your wrist. After exercise, count the number of beats for six seconds. Add a "0" to this number.
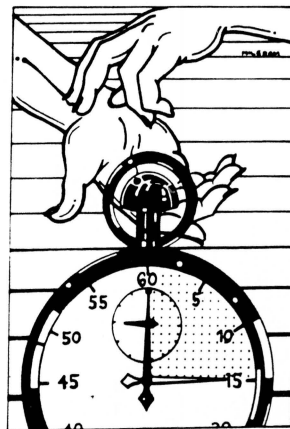
APPENDIX J, CONTINUED

APPENDIX J, CONTINUED

Activity Log

Week 1
Day 1_____

Day 2_____

Day 3_____

Day 4_____

Day 5_____

Week 2
Day 1_____

Day 2_____

Day 3_____

Day 4_____

Day 5_____

Week 3
Day 1_____

Day 2_____

Day 3_____

Day 4_____

Day 5_____

Week 4
Day 1_____

Day 2_____

Day 3_____

Day 4_____

Day 5_____

APPENDIX J, CONTINUED

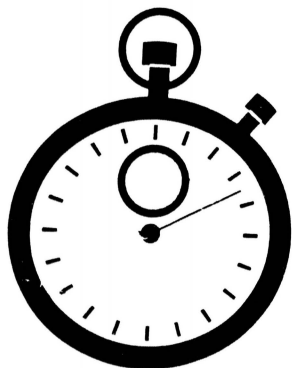| Week	Warm-up	Walking Program Miles	Pace	Cool-down	Frequency
1-2	5-7	1	3	5-7	5
3-4	5-7	1.25	3	5-7	5
5-6	5-7	1.5	3.5	5-7	5
7-8	5-7	1.75	3.5	5-7	5
9-10	5-7	2.0	3.5	5-7	5
11-12	5-7	2.0	3.75	5-7	5
13-14	5-7	2.25	3.75	5-7	5
15-16	5-7	2.5	4	5-7	5
17-18	5-7	2.75	4	5-7	5
19-20	5-7	3	4	5-7	5

F.I.T.

Frequency

3 - 5

Intensity

55 - 75%

Duration

20 - 30 min.

Target Heart Rate

220

\- Age

= _____

X 55% - 75%

= _____

_____
Target Heart Rate

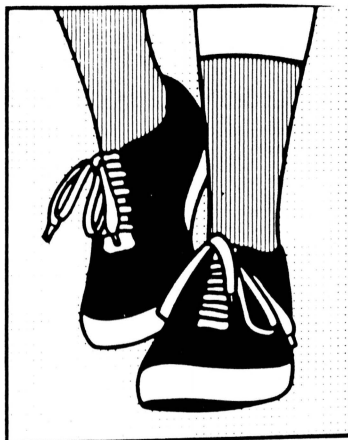APPENDIX J, CONTINUED

How to Walk for Health

Stretching

Stretch until you feel your muscles

Slow and easy

Hold the stretch for 15 seconds

Repeat

Walking
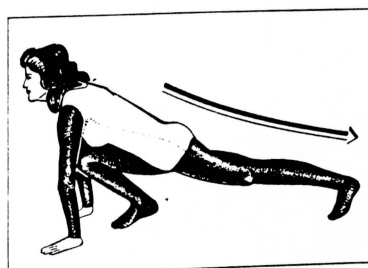
Head up

Back Straight

Abdomen/Buttocks tight

Heel plant and roll/Toe push off

Arms at 90 degrees angles

APPENDIX J, CONTINUED

My Exercise Goal

_____

_____

_____

Notes

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX J, CONTINUED

Normal Values

Resting Heart Rate

	Excellent	Good	Fair	Justo	Poor
Male	42-54	55-60	62-67	69-74	78-79
Female	47-58	60-65	67-71	73-79	81-90

Blood Pressure

Risk Factor	Very Low	Low	Moderate	High	Very High
Systolic	<110	120	130-140	150-160	>170
Diastolic	<70	76	82-88	94-100	>106

APPENDIX K

INTERPRETATION CONTRACT

APPENDIX K

INTERPRETATION CONTRACT

I, _____, agree to the terms and conditions as stated below regarding interpretation services for Celebration of Heart Health classes. The classes will be taught at _____. The hourly rate is $15 an hour to be paid for interpretation services during classes and working sessions with Instructor. Service Contract begins at first working session and ends on the last day to provide interpretation services.

Payment will be made for total sum on the last day to provide interpretation services.

_____   _____
_____, Interpreter   Date

_____   _____
Beverly Tremain, Instructor   Date

APPENDIX K, CONTINUED

Celebration of Heart Health
Payment Schedule

Name of Interpreter: _____

All payments are for services rendered from _____ through _____ .

Date   Hours Interpreted X Hourly rate   =   payment

Total Hours:_____

Total Payment:_____

I, _____, agree that payment for all services has been made

as of _____ .

_____   _____
Interpreter   Date

_____   _____
Beverly Tremain, Instructor   Date

APPENDIX L

SAMPLE SIGN-IN SHEET

APPENDIX L

SAMPLE SIGN-IN SHEET

Celebration of Heart Health
Class Register
Site:_____
Date(s)_____

Name   Telephone/Address

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX M

PUBLICATIONS AVAILABLE FROM THE AMERICAN HEART ASSOCIATION

FOR THE HISPANIC POPULATION

APPENDIX M

PUBLICATIONS AVAILABLE FROM THE AMERICAN HEART ASSOCIATION

FOR THE HISPANIC POPULATION

Item Number	Title/Description	Cost
51-1008	About High Blood Pressure	.15
50-1009	After a Heart Attack	.25
51-1104	Children & Smoking: A Message to Parents	free
50-1039	Cholesterol and your heart	.25
51-040	E is for Exercise	free
TA70	What Every Woman Should Know HBP	.05
50-1103	Smoking and Heart Disease	free
64-8075	Making Mexican Food Heart Healthy	free

Addition educational pamphlets and resources are available by contacting your local American Heart Association.