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Use of pedometers to promote improvement in selected physiological measurements in an older female Mexican American population

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USE OF PEDOMETERS TO PROMOTE IMPROVEMENT IN SELECTED PHYSIOLOGICAL MEASUREMENTS IN AN OLDER FEMALE MEXICAN AMERICAN POPULATION

A Thesis

by

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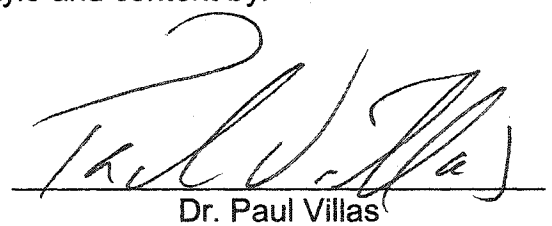

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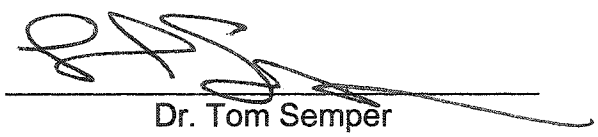

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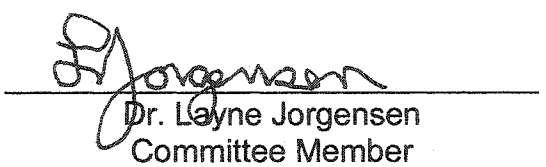

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ABSTRACT

Romero, Zasha., Use of Pedometers to Promote Improvement in Selected Physiological Measurements in an Older Female Mexican American Population. Master of Science (MS), December, 2004, 47 pp., 13 tables, 30 references.

The problem of this study was to determine if pedometers promoted daily walking exercise reflected by changes on selected physiological measurements in older Mexican American females. Significance in the study was determined at the 95% level of confidence. The researcher offered the null hypothesis of no difference in results from the pretest to the posttest in both the control and treatment groups for the selected physiological measurements. The subjects of this study were 55 Mexican-American females ages 60 to 75. The subjects were randomly assigned to a treatment or control group. An analysis of covariance (ANCOVA) method was used to treat the data for significance of difference between group means. The null hypothesis was rejected for the following variables: weight, systolic blood pressure, diastolic blood pressure, predicted Max VO2 and waist girth. The null hypothesis was not rejected for BMI and resting heart rate.

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CHAPTER I

INTRODUCTION

Background

While physical activity is at an all time high in the United States population, the quality and quantity of such activity may not be enough to make a positive impact. It is estimated that more than 60% of adults in the United States do not achieve the recommended amount of regular physical activity and 25% are not active at all (Surgeon General, 2000). Though segments of the general public should be knowledgeable about the health benefits derived from physical activity, the elderly must be reminded that activity can make the difference between mobility and dependability. Many of the health ailments reported by the elderly population today are of a result of sedentary lifestyles and the lack of proper nutrition. In overweight elderly, this can have negative health consequences or in extreme cases, death. Research provides encouraging evidence that disability prior to death is not an inevitable part of a long life, but may be prevented by physical exercise. Furthermore, physically active elders were more likely to die without disability when compared with sedentary adults (www.therubins.com). It is interesting to note that poor health contributes to sedentary lifestyles, but lack of health also serves as a motivator to become

more physically active. Changes in health status, therefore, may serve as cues to adopt a healthier lifestyle (Kriska, 1998).

The quality and type of activity programs an individual needs should be taken into account when planning for an elderly group. This is especially true when developing activity programs for elderly populations, minority groups, and Mexican Americans in particular since there is a lack of such programs. One of the most important activities that can keep a person healthy or return a person to good health is a walking lifestyle (Crespo, 2003). However, education without proper instruction is not enough to help a community that is not actively engaged in physical activity. Walking is a basic form of exercise which is simple to do and can be easily quantified (Moore, 2004). An elderly population that is inactive and is not in the best of physical condition can begin an individualized walking routine in which their progress could be tracked. Such a walking program can be evaluated with a pedometer. A pedometer is a small sensor that measures movement such as the number of steps taken throughout a workout or a day. It is virtually inexpensive and simple to use (Sallis, 2003).

Statement of the Problem

The problem this study addressed was to determine if pedometers promoted daily walking exercise reflected by changes on selected physiological measurements in older Mexican American females. Significance for the study was determined at the 95% level of confidence. The researcher offered the null hypothesis of no difference in results from the pretest to the posttest in both the control and treatment groups for the selected physiological measurements.

Purpose of the Study

The purpose of the study was to compare two groups of older Mexican American females and evaluate the effect a pedometer had on selected physiological measurements. The selected physiological measurements were: weight, body mass index, resting systolic blood pressure, resting diastolic blood pressure, resting heart rate, predicted Max VO2, and waist girth circumference.

Need for the Study

There was substantial literature describing the use of pedometers as well as their implementation and utilization as a health promotion instrument. Studies have utilized pedometers with different ethnic groups. However, no literature indicating pedometer usage with an older female Mexican American population was found. Due to the high incidence of diseases directly associated with obesity in the Mexican American population, studying methods to increase physical activity in an older Mexican American female population appears to have merit. It seems imperative that new techniques and procedures be developed and implemented to help the elderly population attain the physical wellness that they lack and thereby reduce obesity. New research into exercise promotion can introduce different methodologies that add to the wellness continuum. Because of the lack of attention to an elderly female Mexican American population, need for this research was apparent.

Delimitations

This study was designed to test the effectiveness of a pedometer as an instrument to help promote physical activity in older Mexican American females. The following delimitations were imposed upon this study:

1. The participants were attendees to the Alton Community Center.
2. The participants were all females between the ages of 60 and 75.
3. The participants were all Mexican American.
4. The study was 12 weeks in duration.
5. Walking was chosen as the type of exercise employed to determine the selected physiological measurements.
6. Pedometers were calibrated for participants with a height of 64 inches.
7. Participants with any medical condition or deformities were not included in the research.

Limitations

The following limitations were noted in this study based on the selection of participants.

1. Participants were selected from one single community and may not be representative of the entire Mexican American female population.
2. Some of the participants missed participation of activities for personal or physical reasons.

Assumptions

The following assumptions were made in conducting this study:

1. Pedometers were calibrated to accurately measure steps and movement.
2. The participants' log of walking activity was completed daily.
3. The participants cleared all pedometer-recorded data every night.
4. The participants returned completed walking logs every 3rd week of the 12-week study.
5. No other external influence encouraged the participants to exercise.

Definition of Terms

The following terms facilitated the understanding of this study and were used throughout the literature:

1. Physical activity: Physical activity referred to walking.
2. Elderly: Characteristic of later life; past 60 years of age.
3. Health ailments: Body disorder or chronic disease.
4. Sedentary lifestyles: Lack of physical activity.
5. Pedometer: Sensor that recorded the distance a person traveling on foot by responding to the motion of each step.
6. Older: Referred to Mexican American women 60-75 years of age.
7. Physical wellness: Quality or state of being in good health especially as an actively sought goal.
8. Vigorous exercise: Exercise carried out forcefully and energetically.
9. Brisk walk: Being able to accomplish unassisted walking.

10. Promotion scheme: Act of furthering the growth and development of physical activity.
11. Strenuous exercise: Exercise marked by vigorous energy or stamina.
12. Moderate exercise: Exercise marked by average energy or stamina.

Summary

Many of the chronic health conditions that plague the elderly population are linked to obesity (diabetes, heart failure, cholesterol, etc.). An increase in physical activity can help the elderly reach the goal of a healthier lifestyle (Daniels, 2000). Recent literature citations of pedometer use have induced consumers to believe that by using the pedometer, one can increase personal activity levels. However, it is important to understand the procedures and methods in which the use of this instrument would lead to increased physical activity.

Organization of the Remainder of the Study

The presentation of related literature relevant to this study follows in Chapter Two. This chapter acquaints the reader with research that has been made in the development and improvement of the pedometer. Vital background on exercise through walking and exercise in older adults is included. In the succeeding chapters the writer explains the methodology followed in this study, presents the findings and analysis, and reports conclusions and recommendations.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The pedometer is not a new idea and the quantity of information available about its use is well represented in published literature. Literature about pedometers and how they relate to the exercise of older females is plentiful. The most significant of these contributions is presented as background to this study. Since the information on the subject was intensely diversified, the information was divided into three major headings: 1) Pedometers, 2) Exercise through walking, and 3) Exercise in older adults.

Pedometers

The American College of Sports Medicine, the U.S. Surgeon General, and the Center of Disease Control and Prevention have recommended that adults engage in 30 minutes of moderate physical activity each day for at least four days out of the week (Corbib, 2004). Walking was recognized as the easiest and least expensive form of exercise for sedentary patients (Sallis, 2003). Physicians have often wondered how to motivate patients to consistently participate in an exercise routine. Today an answer that seemed to have

common acceptance amongst the medical and health community is the pedometer.

The pedometer has given a person the ability to set a measurable daily goal. Catrine Tudor Locke, PhD, at the Prevention Research Center at the University of South Carolina in Columbia stated that a pedometer is an inexpensive device that costs between $5 and $50 and is worn at the waist. It contains a lever that reflects upon vertical acceleration of the hip. The acceleration represents a step. In essence, the pedometer is a small sensor that provides the wearer with a predicted count of steps he or she takes. Why 10,000 steps? A sedentary adult takes between 2000 and 4000 steps per day. It is estimated that 3000 to 4000 steps are equivalent to 30 minutes of moderate walking (Shiu-Thorton, 2004). How can a pedometer help a sedentary person lose weight and improve health? In counting the number of steps a person takes over a certain time, the pedometer can help produce a daily measurable goal. A measurable goal is the key instead of "I'm going walking today." There is no consistency, but if you have a goal and you attain it, you prove to be on your way to better health (www.vkrshop.com). It takes roughly 2,000 steps to walk a mile. In normal daily activity, most people cover about two to three miles, depending on how active their lifestyle. That would account for about 4,000 to 6,000 steps a day. A person only needs 4,000 more steps to reach 10,000, which is about two miles or a 30-minute walk. The 10,000 daily steps goal is roughly equal to the surgeon general's recommendation to accumulate at least 30 minutes of additional activity (based on normal daily life) most days of the week

(www.walkinginfo.org). The advantage of pedometers is that they catch small increases in activity like walking upstairs instead of taking the elevators. Many people who increase activity while wearing a pedometer seem to do so through these small bits of walking that would probably escape anyone's attention, but a pedometer can record them.

Exercise Through Walking

Tommy G. Thompson, Secretary of Health and Human Services has stated: "Poor eating habits and inactivity are contributing factors to Americans declining health," (Lindberg, 2002). Surveys and government studies have shown that 30% of adults and 20% of children in the United States are now overweight or obese (Newman, 2004).

It has been said that if we could bottle exercise, we'd have a medicine that could treat the majority of today's health problems (www.diabetes.com). The American institute for Cancer research recommends at least an hour of moderate activity daily as part of a healthy lifestyle to lower disease. Less than a quarter of American adults follow these guidelines (Schnirring, 2001). Regular physical activity has been associated with reduced risk for cardiovascular disease, diabetes, and death in the general population. In 2003, Omron healthcare enrolled educators to help sign up participants with pre-diabetes symptoms to complete a 3-month study. The study consisted of participants receiving a pedometer to monitor their steps and making a commitment to walk 10,000 steps a day. The pedometer was used as a motivational tool to help participants improve their health and hopefully lower the incidence of diabetes.

Out of 44 participants, the average number of steps was 3,100 a day. Their goal was to increase this to 10,000 steps a day. After just four weeks the participants saw significant change in blood glucose, weight, body fat, cholesterol, and fitness. As a result of the three month program, those who walked or exercised three times a week for at least 30 minutes lost five percent to seven percent of their body weight and reduced their risk of diabetes by 58%. For those older than 60, the risk reduction was 71%, better than any drug ever used. People tend to believe that only vigorous exercise can lead to better fitness levels. This research showed that just by increasing everyday activities, one could make a difference (Le Masurier, 2003).

In an effort to assist individuals in increasing their activity levels, the Minnesota managed care organization (MCO) dedicated resources to a 1000 person program called 10,000 Steps. The program targeted adults 30 to 50 years of age. They were prepared to become more physically active. The program was designed as an eight-month long trial in which participants would keep a log record of their steps. The participants were given a pedometer as a motivational tool that would help them increase their physical activity. Participants in the program were evaluated once at eight weeks and again at eight months. At the end of eight months, a telephone survey was implemented to record the results of the program. Eighty-one percent of the participants contacted said that the program assisted them in increasing their physical activity levels. After the first eight weeks, those who increased their physical activity

reported that they were still active and feeling better. All participants reported progress.

In 1996, a program called Health Walks was implemented as a health promotion scheme. Local fitness instructors were recruited to organize walks and recruit volunteers to act as guides. Their preparation included CPR training and awareness of the health benefits of walking. The expected outcome was that people would become more physically active and thereby reduce the incidence of illness and stress levels. The program targeted the entire community and was modified to last three months. A log of the activity was kept and the outcomes reviewed at the end of three months. People reported walking for short trips rather than using their cars. They also reported an increased awareness of fitness as a result of this program. Upon evaluation, the results showed a 10% decrease in the level of illness. About 25% reported reduced stress levels, 60% reported higher stamina levels, and 55% reported higher energy levels. The success of this program was a benefit to all, and the implementation of similar programs became the norm throughout the neighboring communities (www.jr2.ox.ac).

Exercise in Older Adults

Healthy People 2010 states increased physical activity as one of its goals and documents the health benefits of physical activity. However, the document also reported that older adults are less physically active than any other age group (Shiu-Thorton, 2004). Medical research has shown that for healthier older adults, physical activity has a protective effect against disease while also

enhancing levels of functionality. Exercise does not have to be strenuous; moderate exercise improves sleep quality, decreases pain from arthritis, increases bone density, increases resting metabolism rate, and often lowers blood pressure in persons with hypertension (Daniels, 2002). What is considered to be moderate exercise? A study of approximately 22,000 women aged 40 to 65 set the definition of "brisk walking" as walking at least three miles in one hour. Vigorous exercise was defined as sports, jogging, heavy gardening, etc. Exercise that built up a sweat would be considered vigorous. Research found that as little as an hour a week of brisk walking helped reduce heart attack risk. Even with all the research on the role of exercise in creating good health, 60% of our population is sedentary, putting themselves at risk of heart disease, obesity and diabetes (Kindela, 2002).

For senior citizens, age, ethnicity, income, and fear of crime can impact their confidence and commitment to exercise. A senior citizen's survey about physical activity asked whether concerns of crime, lack of sidewalks, poor weather, and other factors kept the subjects from walking or exercising more. In addition they were asked about physiological barriers such as pain, swelling, fear of falling, fear of chest pain, or shortness of breath. The respondents had limited confidence in their performance abilities and the outcome they would attain. The research found that older aged individuals felt more limited in their abilities to engage in physical exercise than younger persons, and females had lower confidence that they could engage in physical activity than males. Individuals who were encouraged to exercise by family, friends, and doctors had greater

confidence in their abilities to engage in physical activity. Participants who expressed a fear of crime had greater confidence that they would be able to engage in physical activity than individuals who did not. It may be that persons who see crime as a barrier could identify solutions such as indoor exercise that can eliminate some other emotional barriers and may increase opportunities for social support. Nearly half of the respondents were worried that they might experience chest pain or shortness of breath while exercising (Clark, 1999).

Summary

The relevant literature reported that walking activity for an older population offers great health benefits. Also, an instrument like a pedometer was an effective and inexpensive way of motivating individuals to participate in physical activity. The literature indicated that:

1. Walking regularly decreases illness
2. Walking regularly reduces stress levels
3. Walking regularly increases blood pressure levels
4. Walking regularly increases energy levels

The review of literature about the use of pedometers as a motivational tool indicated that no comparative study had been found that used older Mexican American females as participants. A need for such a study was important and prompted the researcher to initiate this study.

CHAPTER III

PROCEDURES OF THE STUDY

Introduction

This chapter presented the procedures of the study in 13 sections. The first section discusses the participants in the study. The second section presents the meeting schedule of the participants. The third section discusses the selected physiological measurements that were tested. The fourth section explains the log records used in data gathering. The fifth section discusses the treatment group while the sixth explains the control group. The seventh section explained the equality of the study while the eighth discusses the selection of the activity. The ninth, tenth, and eleventh sections discuss the outside interference and motivation, the testing procedures, and the variables tested respectively. The twelfth section explains the treatment of data.

Participants

The participants of this study were 55 Mexican American females ages 60- 75. Most were attendees of the Alton Community Center located in Alton, Texas. The participants were selected from the Alton Community Center and then randomly assigned to one of two groups (Treatment or control). The

randomization of the groups was conducted according to the table of random numbers used in Statistical Methods for Research Workers (Oliver, 2003). Any participant having any condition that prevented them of completing normal walking activities was not included in the study.

Meeting schedule

Before the program began, the researcher constructed a meeting schedule and procedures to follow. The program duration was to be 12 weeks long with two mandatory group meetings. The meetings were meant to gather information on the participation of individuals and to log the number of steps taken. In addition to the two mandatory meetings, the researcher contacted each participant once a week via telephone to ensure the progress of the program. The first group meeting was held to discuss the program and give the participants information on the health benefits of physical exercise. The initial meeting was also conducted to collect specified measurements crucial to the results of the program.

Selected Physiological Measurements

As part of the pre and post test, a collection of specific measurements that helped the research establish difference between both groups was conducted. These measurements included:

1. Age
2. Weight

3. Height
4. Body Mass Index (BMI)
5. Resting Blood Pressure
6. Resting Heart Rate
7. Waist Girth Circumference
8. Predicted Max VO2 from Non-Exercise Data

The selected participants had to participate in a walking program and be able to commit to a 12 week program that involved moderate exercise as a means of evaluation. To qualify, the participants were able to perform a brisk walking activity and keep a detailed log of the steps taken daily.

The selected physiological measurements chosen for this study were derived from a Canadian based study called Increased Physical Activity and Improved Health Measures with a Pedometer-Based Physical Activity Intervention for Type 2 Diabetes (www.uwo.ca). With permission from the author, it was modified to meet the criteria of this study. An analysis of covariance (ANCOVA) method was used to analyze the data for significance of difference between group means. Range, mean, and standard deviation were determined to utilize the ANCOVA statistical assessment.

Log

Prior to presenting the pedometers, the groups were randomly assigned. Each participant from the treatment group was instructed in the appropriate way of completing the entry logs to facilitate the evaluation of the program. The logs

consisted of recording the number of steps the participant completed in a day. Entries into the logs were completed daily. The participants log records summary is presented in appendix B.

Treatment Group

The treatment group participants received a pedometer and were instructed in its use. The pedometer was used as a motivational tool only; the participants were instructed to try and increase the number of steps they produced in one day. Logs were available to the group so the number of steps could be recorded.

Control Group

The control group did not receive a pedometer or entry logs to help them keep track of their activity. They were instructed to provide the measurements that the pre test required. They were instructed to return at the end of the twelve weeks to complete a post test and evaluate their progress.

Equality

All participants who volunteered were presented with a detailed lecture on the health benefits of physical activity and nutrition. The lecture included advice on beginning an exercise program and the appropriate nutritional intake for the elderly population. The participants were then randomly selected into control and treatment groups. These groups were divided prior to presenting the

pedometers. All participants were instructed about two mandatory meetings and both received a weekly call to ensure compliance with the program. The researcher answered any questions that arose in regards to the study. The treatment group was the only one to receive a pedometer and entry logs.

Selection of Activity

Walking was the activity chosen for this research. Walking was selected since the activity was not complicated and testing or training would not be necessary. Walking often protects against two of our major contributing killers, obesity and high blood pressure, which are among the leading risk factors for heart attack and stroke (**www.gsa.gov**). Walking was also selected because the results of a walking program would facilitate the evaluation of the study. The lack of bias attributed to the physical stature of the subjects and the low possibility of interaction with previous practice was considered in the choosing of the activity. Another rationale was the low impact characteristics of the activity and the minimum amount of time needed to implement walking as a variable of this study.

Outside Interference and Motivation

The initial presentation provided motivation and instruction for both groups. Both groups were told about the 12 week program that recommended normal activities throughout their day. The researcher implemented a detailed lecture on the health benefits of physical activity and nutrition. It was assumed

by the researcher that there was no other outside influence that directly motivated the control group to exercise. The treatment group was aided by the use of pedometers and entry logs.

Testing procedures

The initial meeting encouragement was the same for both the control and treatment groups. The researcher lectured and motivated the participants on the benefits of physical exercise and nutrition. A pretest and posttest at the end of the 12 week program evaluated the study.

Variables Tested

The following variables were tested in a pre and posttest to obtain values that allowed the researcher to determine any physical gains or losses: weight, BMI, resting systolic blood pressure, resting diastolic blood pressure, resting heart rate, predicted Max VO2 from Non-Exercise Data, and waist girth circumference. Weight was measured on a Health o Meter electronic scale by Sunbeam Model HDL110. BMI was calculated on a body-mass-index-computerized program utilizing weight and height (www.halls.md/body-mass-index/bmi.htm). Resting systolic and diastolic blood pressures and the resting heart rate were measured with an Intelli Sense Blood Pressure Monitor by Omron Model HEM-907. Predicted Max VO2 was obtained by utilizing a Max VO2 from a non-exercise computerized program that utilized a three-question survey: gender, weight, and height of the participant

(www.brianma.demon.co.uk/vo2maxnd.htm) and waist girth circumference was measured with a cloth measuring tape. To assure the accuracy of the resting heart rate, this measurement was administered while the participants were sitting down.

Treatment of Data

The selective physiological measurements chosen for this study were derived from a Canadian based study called Increased Physical Activity and Improved Health Measures with a Pedometer-Based Physical Activity Intervention for Type 2 Diabetes (www.uwo.ca/actage/new/first_step.htm). With permission from the author, it was modified to meet the criteria of this study. An analysis of co-variance (ANCOVA) assessment was used to treat the data for significance of difference between group means.

Summary

Throughout the study, emphasis was placed on ensuring that the procedures followed were in the experimental design. This chapter outlined the procedures involved in using the pedometer as a motivational tool. The participants were divided into a control and treatment group using the table of random numbers implemented in the book Statistical Methods for Research Workers. The treatment group was given pedometers and entry logs to keep track of their progress for 12 weeks. The control group was instructed to try to improve their everyday activity through out the 12 week study. At the beginning

of the study both groups were given a motivational lecture on the effects of exercise and nutrition on everyday life. Both were administered a pre and posttest to help the researcher evaluate the progress of the study. The analysis of covariance (ANCOVA) statistical analysis was utilized to determine the significance of difference between group means. All the participants in the study were attendees to the Alton Community Center.

CHAPTER IV

ANALYSIS OF DATA

Introduction

This chapter presents the results of the investigation in three sections. The first section discusses the face validity investigation on a sample of participants involved in health education. The second section presents the distribution of eligible participants based on physical ability to perform walking tasks. The third section presents the results of the investigation.

Face Validity of the Investigation

Since it was assumed that senior female Mexican American women were not familiar with pedometers, the researcher decided on testing that assumption. It was also assumed that the pedometers identified for the study were not correctly calibrated at the factory; therefore, the researcher also tested the calibration on each pedometer that was used in the study. A group of seven females was obtained and the researcher learned that familiarity with pedometers was mixed. However, no one was actively engaged in physical activity using pedometers as motivational tools.

The pedometers selected for use in the study indicated that various types of adjustments were necessary. Adjustments were made for adult users, and the researcher calibrated each pedometer for identical step measurements. It was determined that the majority were synchronized with each other. However, 15% had to be re-calculated to conform to the step measurement of the majority of pedometers. It was determined that the step count for each step credited was accurate in all pedometers after calibration.

Distribution of Eligible Participants

It was determined that all potential participants had to have medical clearance and not be utilizing walking aids for mobility. The initial plan was to compare two groups of 30 participants each from two different community centers. However, after eligibility screening, 27 individuals were randomly assigned to the pedometer treatment group and 28 to the control group from one community center.

Results of the Investigation

The data were obtained from comparing two groups; one included 27 older Mexican American females utilizing pedometers to encourage walking, while another group had 28 older Mexican American females who were just presented with education on the importance of diet and exercise. Pretest and posttest data were checked for reliability by the use of an analysis of covariance (ANCOVA) method.

Analysis of Co-Variance

An analysis of covariance (ANCOVA) assessment was used to test the prediction that the difference in results was specifically related to the selected physiological variables of the treatment group and from the variables of the control group. The ANCOVA was chosen to maximize power in detecting the differences the effects of exercise had on the selected variables and thereby reducing the probability of type II error.

Table 1(Appendix A) presents data for the pretest control group. The data is summarized and is presented in ranges, mean values and standard deviations. The average age of the control group was 68.25; the control group averaged 163.23 pounds and 61.04 inches in height. The BMI average for the control group was 31.18. The group's resting systolic average blood pressure was 146.07, resting diastolic average blood pressure was 82.96, and the average resting heart rate was 69.32 beats per minute. The average predicted Max V02 from non-exercise data was 19.93. The average waist girth circumference was 37.14 inches.

Table 2 (Appendix A) presents data for the posttest control group. The data is summarized and is presented in ranges, mean values and standard deviation. The average age was 68.25; they averaged 165.43 pounds and 61.04 inches in height. The control group's posttest BMI average was 31.29. The group's resting systolic average blood pressure was 147.57, resting diastolic average blood pressure was 85.89, and the average resting heart rate was 72.68

beats per minute. The predicted Max V02 average from Non-Exercise Data was 19.57. The average waist girth circumference was 37.84 inches.

Table 3 (Appendix A) presents data for the pretest treatment group. The data is summarized and is presented in ranges, mean values and standard deviation. The average age of the treatment group was 66.25; the group averaged 161.20 pounds in weight and 59.56 inches in height. The BMI average for the treatment pre test group was 32.07. The resting systolic average blood pressure for the treatment group was 143.67, resting diastolic average blood pressure was 84.41, and the average resting heart rate was 68.04 beats per minute. The predicted Max V02 from Non-Exercise Data average was 18.30. The average waist girth circumference was 36.52 inches.

Table 4 (Appendix A) presents data for the posttest treatment group. The data is summarized and is presented in ranges, mean values and standard deviation. The average age of the posttest treatment group was 68.25; the group average 165.43 pounds and 61.04 inches in height. The BMI average for the treatment group was 31.29. The posttest treatment group's resting systolic average blood pressure was 147.57, resting diastolic average blood pressure was 85.89, and the average resting heart rate was 72.68 beats per minute. The predicted Max V02 from Non-Exercise Data average was 19.57. The average waist girth circumference was 37.84 inches.

Table 5 presents group means for comparison purposes for the pretest and posttest control participants and the pretest and posttest treatment participants.

Table 5. Pre & Post Group Means

Measurements	Control Pre Test	Control Post Test	Treatment Pre Test	Treatment Post Test
Weight (Lbs)	163.23	165.43	161.2	159.33
Height (inches)	61.04	61.04	59.56	59.56
BMI	31.18	31.29	32.07	31.51
Blood Pressure Systolic	146.07	147.57	143.67	136.89
Blood Pressure Diastolic	82.96	85.89	84.41	79.59
Resting Heart Rate	69.32	72.68	68.04	68.33
Max VO2	19.93	19.57	18.3	18.83
Waist Girth	37.14	37.84	36.52	36.19

Seven analyses of covariance (ANCOVA) tests were performed on data mean summaries. The Null Hypothesis formulated for this study stated that:

> Ho – There is no difference in results from the pretest to the posttest in both the control and treatment groups for weight, body mass index, systolic blood pressure, diastolic blood pressure, resting heart rate, predicted MaxVO2 from non exercise data, and waist girth circumference.

It was determined that significance would be at the 95% confidence level. Tables 6 through 12 present the results of the analysis for seven different variables. An ANCOVA was used to test for differences between groups, with the posttest measurements as the dependent variable and the pretest measurements as the covariate.

Table 6 presents the summary ANCOVA for weight loss in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 160.46) was significantly higher (F = 25.60, p< .05) than those of the control posttest (adjusted means = 164.18).

Table 6. Means Pretest and Mean and Adjusted Mean Scores for Weight Lbs

				Post test		
		Pretest		*Obtained*		*Adjusted*
Group	*n*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*
Treatment	27	161.20	33.59	159.33	33.13	160.46
Control	28	163.23	31.54	165.43	31.52	164.18
p < .05		F= 25.60				

Table 7 presents the summary ANCOVA for body-mass-index in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 31.08) was not significantly higher (F = 1.86, p> .05) than those of the control posttest (adjusted means = 31.65).

Table 7. Means Pretest and Mean and Adjusted Mean Scores for BMI

		Pretest		Post test		
				Obtained		Adjusted
Group	*n*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*
Treatment	27	161.20	33.59	159.33	33.13	31.08
Control	28	31.18	6.26	31.29	6.02	31.65
$p > .05$		F= 1.86				

Table 8 presents the summary ANCOVA for systolic blood pressure in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 137.9) was significantly higher ($F = 9.79$, $p < .05$) than those of the control posttest (adjusted means = 146.6).

Table 8. Means Pretest and Mean and Adjusted Mean Scores for Systolic Blood Pressure

		Pretest		Post test		
				Obtained		Adjusted
Group	*n*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*
Treatment	27	143.67	21.91	136.89	21.69	137.9
Control	28	146.07	24.18	147.57	21.33	146.6
$p < .05$		F= 9.79				

Table 9 presents the summary ANCOVA for diastolic blood pressure in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 78.93) was significantly higher ($F = 13.87$, $p < .05$) than those of the control posttest (adjusted means = 86.53).

Table 9. Means Pretest and Mean and Adjusted Mean Scores for Diastolic Blood Pressure

				Post test		
		Pretest		***Obtained***		***Adjusted***
Group	*n*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*
Treatment	27	84.41	15.19	79.59	16.05	78.93
Control	28	82.96	10.29	85.89	11.35	86.53

$p < .05$ $F = 13.87$

Table 10 presents the summary ANCOVA for resting heart rate in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 69.01) was significantly higher ($F = 2.97$, $p > .05$) than those of the control posttest (adjusted means = 71.88).

Table 10. Means Pretest and Mean and Adjusted Mean Scores for Resting Heart Rate

				Post test		
		Pretest		Obtained		Adjusted
Group	n	Mean	S.D.	Mean	S.D.	Mean
Treatment	27	68.04	9.78	68.33	10.03	69.01
Control	28	69.32	12.40	68.04	9.78	71.88
p> .05		F= 2.97				

Table 11 presents the summary ANCOVA for Max VO2 in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 19.64) was not significantly higher (F = 21.18, p< .05) than those of the control posttest (adjusted means = 18.81).

Table 11. Means Pretest and Mean and Adjusted Mean Scores for Predicted Max VO2

				Post test		
		Pretest		Obtained		Adjusted
Group	n	Mean	S.D.	Mean	S.D.	Mean
Treatment	27	18.30	5.83	18.83	5.83	19.64
Control	28	19.93	4.68	19.57	4.69	18.81
p < .05		F= 21.18				

Table 12 presents the summary ANCOVA for waist girth in the control and the treatment groups. The total posttest score with total measured pretest scores as the covariate indicated that the posttest treatment (adjusted means = 36.52) was significantly higher ($F = 9.32$, $p < .05$) than those of the control posttest (adjusted means = 37.45).

Table 12. Means Pretest and Mean and Adjusted Mean Scores for Waist Girth

				Post test		
		Pretest		*Obtained*		*Adjusted*
Group	*n*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*
Treatment	27	36.52	4.46	36.19	4.46	36.52
Control	28	37.14	3.89	37.84	3.41	37.45
$p < .05$		$F = 9.32$				

The participants log records summary is presented in appendix B.

Summary

This chapter presented an analysis of the data that was obtained from a control and treatment older Mexican American female population. Presented here was face validation on a sample of pedometers to establish correct calibration and on their utility to establish motivation. Also, demographical characteristics of the sample along with mean and standard deviation measures on seven different study variables are presented. An ANCOVA assessment test was conducted to demonstrate significance.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to determine if selected physiological measurements change due to the utilization of pedometers. The review of related literature provided insight into the need for an exercise program specific to the older population, particularly a female minority group. The investigation participants were 55 Mexican American females ages 60 – 75 who attended the Alton Community Center in Alton, Texas. The participants were assigned into two randomly selected groups. Twenty-eight were assigned into a control group and 27 into a pedometer incentive treatment group. Only participants who were in stable physical condition participated.

The study investigation lasted 12 weeks and studied seven different variables for change. Seven ANCOVA tests were performed on data mean summaries. The Null Hypothesis stated that there would be no difference in results from the pretest to the posttest in both the control and treatment groups for weight, body mass index, systolic blood pressure, diastolic blood pressure, resting heart rate, predicted Max VO2 from Non-Exercise data and waist girth circumference. All seven measurements produced positive change as

determined by the ANCOVA analysis. The null hypothesis was reflected for the following variables: weight, body mass index (BMI), systolic blood pressure, diastolic blood pressure, predicted Max VO2 from non-exercise data, and waist girth circumference. Statistical significance was not proven for the following variable: BMI and resting heart rate.

Findings

Based upon the investigation, the following findings are presented:

1. The null hypothesis was rejected for the following variables: weight, systolic blood pressure, diastolic blood pressure, predicted Max VO2 and waist girth circumference.
2. Some calibration error was found in factory packed pedometers used for the study. The calibration was corrected to provide consistent measures for treatment participants
3. The control group means demonstrated a regression pattern. The weight, BMI, blood pressure systolic, blood pressure diastolic, predicted Max VO2, and waist girth circumference variables increased.
4. The treatment group means demonstrated a significant progression pattern except resting heart rate and body max index (BMI). However, BMI and resting heart rate did show a level of improvement.
5. The weight, systolic blood pressure, diastolic blood pressure, predicted Max VO2, and waist girth circumference variables significantly decreased.
6. The qualitative comments presented in Chapter IV reveal a positive experience by both the control and treatment participants.

7. The qualitative comments presented in Chapter IV reveal a desire to continue with the walking and a desire by the control group to obtain and use pedometers.

The participants and the community center administrator in reaction to the study presented the following qualitative comments:

- *"A program that helps individuals learn about exercise is great. With this information, we give them the tools to hopefully convince them that exercise is an important part of being elder."*
- *"The participants lost weight not only because of the pedometer but because they had the will power to actually go out there and walk."*
- *"The information was relevant to the study and helped me better understand the benefits of exercise."*
- *"At first I didn't understand the concept of the pedometer, but as I learned its function, I understood its value."*
- *"I will keep using the pedometer to increase the amount of exercise that I do."*
- *"If I would have had one of these (Pedometer) I would have walked more just to see if I could increase the amount of walking I do."*
- *"Not only are we getting useful information but you are also giving us the tools to get there, this pedometer is encouragement enough to stay with the program for a long time."*
- *"No wonder Irma lost weight, she had encouragement that we didn't."*

- *"We are grateful that you took the time to come and help us learn the basics of nutrition and exercise, which will benefit us in the long run."*
- *"The participants who didn't have a pedometer were especially glad that you came through and gave them one, it encouraged them to keep their exercise level up and to strive to lose some of the extra pounds that the other ladies had lost."*

Conclusions

The analysis of the findings indicates the following conclusions:

1. The use of pedometers supports positive gains in health indicators for an older minority population. The variables investigated are associated with chronic diseases and any improvement will lower health risk association, therefore, programs like the pedometer walking program can contribute to a healthy population.
2. Though five variables demonstrated statistical significance with an analysis of covariance assessment, resting heart rate and BMI did not did demonstrate true inference at the five percent level of significance. The investigator was encouraged that the variables showed movement in a positive direction.
3. Based on a debriefing with the participants after the conclusion of the study, it was determined that there was no outside motivation or interference in the completion of this study. This leads the investigator to conclude that pedometers or other motivational devices can encourage an

older minority population to begin an exercise program that results in positive health gains.

4. The statistically significant progress indicated by the participants physical measures demonstrate the importance of some type of physical activity in any population.

Recommendations

The recommendations that resulted from this investigation center on the use of pedometers as an enticement to either increase or commence an exercise program are as follows:

1. It is recommended that for future investigations of this type, additional requirements for the participants (such as specific exercise routines and nutritional changes) can facilitate better improvements of most measurements used in this study.
2. The utilizing of a baseline of a minimum number of steps recommended per day can further motivate the participants to be more active.
3. Inviting all persons in the participant's social network to the participant would enhance the number of participants and the quality of the exercise.
4. Utilizing different ethnic groups can make the findings more relevant to the female population.
5. Recommendations for further study include investigating social networks and how they aid or impede the motivation to exercise.
6. It is recommended that a similar investigation as this study be conducted

to extend beyond the 12 week program.

7. It is recommended that a similar investigation that only includes persons who are at a body-mass-index that indicates high health risk be conducted.
8. Utilizing the simplest form of an aid or incentive is recommended to use with an older population.
9. It is recommended that a strong effective health education effort be undertaken to provide workshops and seminars for the older female population.
10. These workshops and seminars should also seek to promote and organize support groups concerned about the older population's health and well being.

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VITA

Zasha Romero was born in Reynosa, Tamaulipas, Mexico, September 17 1972, the son of Eva Araceli and Dr. Ruben Romero. After graduating from Pharr San Juan Alamo High School he served in the United States Navy from 1992 until honorably discharged from active duty in 1994. He served in the Navy Reserves until 1999. He attended South Texas Community College and The University of Texas Pan-American where he graduated with a Bachelors of Science in Kinesiology in December 2002. In the spring of 2001he was employed by The University Of Texas Pan-American as a graduate teaching assistant until his graduation. He received a Master of Science in Kinesiology from The University of Texas Pan-American in December 2004.

APPENDIX

APPENDIX A

CONTROL AND TREATMENT GROUP

PRE AND POSTTEST TABLES

	Table 1. Control Group Pre test								
Participant	Age	Weight Lbs	Height Inches	BMI	Blood Pressure Systolic	Blood Pressure Diastolic	Resting Heart Rate	Predicted Max VO2	Waist Girth
1	66	230	62	42.1	118	88	99	9.99	46.5
2	60	153	60	29.9	132	95	80	20.12	35.5
3	65	139	59	28.1	156	87	53	21.47	34
4	62	193	63	34.2	196	92	67	16.69	42
5	60	174	66	28.1	117	77	55	21.55	37
6	60	200	62	36.6	131	82	76	14.54	39.5
7	75	182	59	36.8	131	54	76	14.23	45
8	75	121	56	27.1	172	86	101	22.45	33
9	70	168	63	29.8	146	73	75	20.33	41
10	68	153	60	29.9	130	82	65	20.12	39.5
11	60	199	62	36.4	151	91	69	14.68	41
12	75	142	59	28.7	153	85	59	20.97	34.5
13	74	115.5	58	24.1	128	62	61	24.9	34
14	74	192	64	41.5	133	65	61	17.52	42.5
15	75	125	58	26.1	148	95	85	23.25	33
16	71	203	63	36	153	91	66	15.16	33
17	60	150	57.5	31.9	108	72	69	18.56	37
18	66	150	63	26.6	151	90	61	23.02	36
19	65	125	64	21.5	109	74	67	27.08	34
20	61	203	57.5	43.2	115	78	72	25.08	31
21	64	199	60	38.9	134	86	67	12.66	38
22	71	193	59	39	150	83	58	12.38	34
23	70	121	63	21.4	174	83	90	27.21	34
24	74	153	59	30.9	159	89	58	19.12	35
25	73	153	62	28	160	92	58	21.68	36
26	74	139	63	24.6	192	90	68	24.58	40
27	73	153	64	26.3	192	90	58	24.56	36
28	70	142	63	25.2	151	91	67	24.15	38
Range	**60-75**	**115.5-230**	**56-66**	**21.4-43.2**	**108-196**	**54-95**	**53-101**	**9.99-27.21**	**31-46.5**
Mean	**68.25**	**163.23**	**61.04**	**31.18**	**146.07**	**82.96**	**69.32**	**19.93**	**37.14**
SD	**5.66**	**31.54**	**2.54**	**6.26**	**24.18**	**10.29**	**12.40**	**4.68**	**3.89**

	Table 2. Control Group Post Test								
Participant	Age	Weight Lbs	Height Inches	BMI	Blood Pressure Systolic	Blood Pressure Diastolic	Resting Heart Rate	Predicted Max VO2	Waist Girth
1	66	233	62	42.61	148	100	90	9.61	46
2	60	155	60	30.3	119	95	92	19.85	36
3	65	136	59	27.5	152	70	53	22.03	36
4	62	198	63	35.1	143	76	86	16.02	41
5	60	175	66	28.2	121	77	68	21.48	38
6	60	206	62	37.7	140	75	85	13.69	40.5
7	75	183	59	37	149	68	90	14.12	46
8	75	120	56	26.9	178	116	102	22.68	38
9	70	163	63	28.9	152	88	93	21.12	39
10	68	157	60	30.7	128	84	67	19.52	40
11	60	195	62	35.7	148	95	74	15.36	41
12	75	146	59	29.5	160	90	56	20.34	35
13	74	120	58	25.1	130	62	65	24.16	36
14	74	190	64	32.6	131	74	72	17.87	42
15	75	127	58	26.5	153	95	86	22.95	33
16	71	209	63	37	160	93	64	14.42	35
17	60	160	57.5	34	113	79	67	16.88	39
18	66	150	63	26.6	153	91	63	22.58	36
19	65	127	64	22	113	76	69	26.69	34
20	61	206	57.5	43.8	119	80	74	24.87	33
21	64	203	60	39.6	140	85	64	12.09	39
22	71	196	59	39.6	148	89	60	11.85	34
23	70	124	63	22	170	86	88	26.81	35
24	74	155	59	31.3	160	90	56	18.83	35
25	73	156	62	28.5	170	95	56	21.27	37
26	74	142	63	25.2	194	96	67	24.18	40
27	73	156	64	26.8	190	87	59	22.7	37
28	70	144	63	25.5	150	93	69	23.9	38
Range	**60-75**	**12 -233**	**56-66**	**22-43.8**	**113-194**	**62-116**	**53-102**	**9.61-26.81**	**33-46**
Mean	**68.25**	**165.43**	**61.04**	**31.29**	**147.57**	**85.89**	**72.68**	**19.57**	**37.84**
SD	**5.66**	**31.52**	**2.54**	**6.02**	**21.33**	**11.35**	**13.62**	**4.69**	**3.41**

	Table 3. Treatment Group Pre Test								
Participant	Age	Weight Lbs	Height Inches	BMI	Blood Pressure Systolic	Blood Pressure Diastolic	Resting Heart Rate	Predicted Max VO2	Waist Girth
1	65	182	62	33.3	96	67	54	17.28	30
2	60	181	59	36.6	149	85	56	14.39	33
3	62	123	58	25.7	127	61	57	23.6	31
4	70	121	59	24.4	136	56	69	24.51	38
5	69	192	58	40.1	149	96	82	11.65	34
6	62	153	59	30.9	160	101	74	19.12	38
7	75	153	62	28	140	81	65	21.67	38
8	71	192	58	40.1	144	93	81	11.65	32
9	73	139	60	27.1	153	89	54	22.38	33
10	65	152	59	30.7	158	103	72	19.28	39
11	60	181	53	45.3	149	111	96	7.17	37
12	70	129.5	59	26.2	162	88	61	23.06	33
13	60	250.5	61	47.3	204	119	69	5.36	49
14	60	251.5	60	49.1	118	81	74	4.17	44
15	63	139.5	61	26.4	136	81	70	22.89	33
16	61	154	57	33.3	133	95	68	17.11	43.5
17	62	143	63	25.3	98	69	56	24	31
18	63	156	61	29.5	110	72	63	20.29	38
19	75	169	65	28.1	170	80	67	21.68	33.5
20	73	123	55	28.6	149	66	56	21.08	37
21	75	169	61	31.9	147	78	74	19.71	37
22	62	146	60	28.5	140	88	69	21.24	36
23	74	117	61	22.1	139	67	64	26.67	32
24	66	140	59	28.5	148	95	64	21.3	39
25	66	166.5	60	32.5	158	74	77	17.93	39
26	74	173	60	33.8	156	92	76	16.89	37
27	69	156	58	32.6	150	91	69	17.89	41
Range	**60-75**	**11-251.5**	**53-65**	**22.1-45.3**	**96-204**	**56-119**	**54-96**	**4.17-24.51**	**30-49**
Mean	**66.85**	**161.20**	**59.56**	**32.07**	**143.67**	**84.41**	**68.04**	**18.30**	**36.52**
SD	**5.47**	**33.59**	**2.37**	**32.09**	**21.91**	**15.19**	**9.78**	**5.83**	**4.46**

	Table 4. Treatment Group Post Test								
Participant	Age	Weight Lbs	Height Inches	BMI	Blood Pressure Systolic	Blood Pressure Diastolic	Resting Heart Rate	Predicted Max VO2	Waist Girth
1	65	180	62	32.9	96	60	55	19.1	30
2	60	177	59	35.7	140	80	50	15.13	32
3	62	119	58	24.9	120	60	55	24.34	30
4	70	120	59	24.2	130	56	68	24.72	38
5	69	194	58	40.5	142	90	80	11.38	35
6	62	150	59	30.3	163	103	76	19.67	37
7	75	151	62	27.6	136	84	66	22.03	38
8	71	190	58	39.7	146	90	76	11.69	32
9	73	137	60	26.8	150	80	50	22.76	33
10	65	149	59	30.1	147	93	73	20.35	39
11	60	180	53	45.1	129	97	93	7.47	38
12	70	131	59	26.5	129	73	62	22.87	31
13	60	246	61	46.5	200	128	64	7.66	48
14	60	248	60	48.4	120	77	80	4.82	44
15	63	138	61	26.1	124	63	75	24.68	32
16	61	152	57	32.9	130	90	66	17.55	42
17	62	141	63	25	100	64	65	24.33	31
18	63	154	61	29.1	92	64	81	22.13	38
19	75	168	65	28	162	80	65	21.86	32
20	73	120	55	22.9	148	66	59	21.7	36
21	75	164	61	31	140	69	71	19.07	37
22	62	145	60	28.3	140	77	69	21.46	36
23	74	117	61	21.9	130	70	60	26.87	31
24	66	138	59	27.9	149	90	66	21.69	39
25	66	165	60	32.2	145	67	77	18.23	41
26	74	170	60	33.2	140	89	70	17.42	36
27	69	158	58	33	148	89	73	17.5	41
Range	**60-75**	**11-248**	**53-65**	**21.9-48.4**	**92-200**	**56-128**	**55-93**	**4.82-24.68**	**30-48**
Mean	**66.85**	**159.33**	**59.56**	**31.51**	**136.89**	**79.59**	**68.33**	**18.83**	**36.19**
SD	**5.47**	**33.13**	**2.37**	**31.51**	**21.69**	**16.05**	**10.03**	**5.75**	**4.6**

APPENDIX B

PARTICIPANT LOG RECORD

Participant Log Record					
Participant	First Three Weeks	Second Three Weeks	Third Three Weeks	Fourth Three Weeks	Total Average
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					

APPENDIX C

INSTRUMENT

SELECTED PHYSICAL MEASUREMENTS IN AN OLDER FEMALE MEXICAN AMERICAN POPULATION

PART I

Name _____

I am interested in finding out about the types of physical activities you do as part of your everyday living. The following questions will ask about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Think about the activities you do at work, as part of your house and yard work., to get from place to place, and in your spare time of recreation, exercise and sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make your breath much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activity like heavy lifting, digging, aerobics, or fast bicycling?

   _____ days per week

   _____ No vigorous physical activities * Skip to question 3

2. How much time did you usually spend doing vigorous physical activities on one of those days?

   _____ hours per day

   _____ minutes per day

   _____ Don't know/ Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace?

   _____ days per week

   _____ No moderate physical activities * Skip to question

How much time did you usually spend doing moderate physical activities on one of those days?

_____ hours per day

_____ minutes per day

_____ Don't know/Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

_____ hours per day

_____ No walking *Skip to question 7

6. How much time did you usually spend walking on one of those days?

_____ hours per day

_____ minutes per day

_____ Don't know/ Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, sitting, or lying down watching television.

7. During the last 7 days, how much time did you spend sitting on a week day?

_____ hours per day

_____ minutes per day

_____ Don't know/Not sure

PART II

8. Age _____

9. Weight _____

10. Height _____

11. Body Mass Index _____

12. Blood Pressure _____

13. Resting Heart Rate _____

14. Predicted Walking Max VO2 _____

15. Waist Girth Circumference _____

APPENDIX D

LETTER OF CONSENT

The University of Texas Pan American Study Title: "The Use of Pedometers to Promote Daily Walking Exercise in an Older Female Mexican American Population"

Contact Information

For questions or comments about the procedures, positive or adverse incidents due to participation in this study or any other attribute of this study, contact the researcher, Zasha Romero at the UTPA Border Health Office, or at the Office number (956) 381-3687. This research has been reviewed and approved by the Institutional Review Board-Human Subject's In Research. For research related problems or questions regarding subject's rights, the Human Subject's Committee may be contacted through Dr. Mark Granberry, Chair, at 318-2287.

Voluntary Participation

Participation in this survey is voluntary and you may withdraw at any time without penalty. Your refusal to participate or desire to discontinue your participation at any time will involve no penalty or loss of benefits you are otherwise entitled.

Consent

I have read and understand the explanations provided to me and voluntarily agree to participate in this study. I have been given a copy of this informed consent form.

Subject's name (print)_____

Signature of Subject _____ Date____/____/_____

Signature of Witness_____ Date____/____/_____

APPENDIX E

LETTER OF APPRECIATION

Alton Community Center
349 W. Dawes Alton, TX 78573
Phone (956)519-2123
Fax (956)519-9503

October 26, 2004

To whom it may concern:

The following is to acknowledge that Mr. Zasha Romero asked and was granted permission from the Alton Community Center to perform a study "Use of Pedometers to Promote Improvement in Selected Physical Measurements in an Older Female Mexican American Population." The study was comprised of 55 females aged 60 to 75.The study lasted three months from July 12 to October 02, 2004. In Addition Mr. Romero was granted use of the facilities to hold two meeting one prior to the study and one upon completion of the three months. Mr. Romero contacted Mrs. Rosa Ortega Colonias Program Coordinator and Director of the Alton and San Juan Community Center, also Mrs. Rosy Cantu supervisor of the Adult Community Center at which location the meetings took place. All the participants involved in the study and the staff of the Alton Community Center as well as the Adult Community Center were very pleased with the results of the study and acknowledge Mr. Romero for bringing positive information and programs to a community that is striving for healthier living.

Rosa Ortega

Rossy Cantu