

Assessment of Physical Activity in Latina Mothers in the WIC Population

Kelleigh Dawn Killen

Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in
partial fulfillment of the requirements for the degree of

Master of Science

In

Human Nutrition, Foods, and Exercise

Elena Serrano, Chair

Gresilda Tilley-Lubbs

Kathleen Poole

March 24, 2006

Blacksburg, Virginia

Keywords: Hispanic, Exercise, Pedometer, Low Income, Validation

Assessment of Physical Activity in Latina Mothers in the WIC Population

Kelleigh Dawn Killen

Abstract

In 2000, the U.S. Census Bureau reported that Latinos represented 12.6% of the total population in the United States. It is projected that by 2010 Latinos will account for 15.5% of the population (1,2). Latinos account for 32% of the population in Texas, and specifically in Corpus Christi, Latinos represent 54% of the population (3). The purpose of this study was to compare reported versus actual physical activity among limited resource Latina mothers. This study also aimed to explore the validity of the existing Behavioral Risk Factor Surveillance System (BRFSS) and Seven-Day Physical Activity Recall (PAR) physical activity assessment tools.

Fifty-five Latina mothers from a Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinic in Corpus Christi, Texas were recruited to participate in this study. Data were collected through a combined (BRFSS and PAR) physical activity questionnaire as well as through step counts using pedometers. BRFSS and PAR reported significantly different levels of moderate physical activity ($p=0.0312$) using Chi Square tests when appropriate. The response rate in PAR for all levels of activity intensity was higher than BRFSS. There were significant trends between the number of steps reported and BRFSS and PAR moderate physical activity. Further, the majority of subjects who averaged greater than 5,000 steps per day did not perceive themselves to be moderately active in either BRFSS or PAR. These findings question the validity of these physical activity assessment tools with this population.

Acknowledgements

I would like to acknowledge all of the people who supported and encouraged me on this journey. First and foremost Dr. Elena Serrano for her unending faith in my ability, and for my committee members Dr. Griselda Tilley-Lubbs and Dr. Kathleen Poole for their support and expertise in the various areas of my project. I would also like to thank Marcela Uribe for all of her hard work in translating questionnaires and taking considerable time with my research. Also, April Travis for her help coding and recording all of the data collected.

I would also like to thank my mother for always being in my corner on each of my stepping stones through my life thus far. Last but definitely not least, I would like to thank my husband, my rock. He knows I could not have done this without him and I am so lucky to have found my soul mate and partner in life. His smile continually lifts me up and I am so excited to be his copilot in life.

TABLE OF CONTENTS

ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES AND FIGURES	vii
CHAPTER I: INTRODUCTION	1
Introduction	1
Glossary of Terms for Physical Activity	3
Study Objectives	4
CHAPTER II: REVIEW OF LITERATURE	5
Introduction	5
Physical Activity Assessment Tools and Latinos	8
Behavioral Risk Factor Surveillance System	8
Seven-Day Physical Activity Recall	10
The Third National Health and Nutrition Examination Survey	11
Limitations of Physical Activity Assessment Tools in Minorities	14
Barriers to Physical Activity in Latinos	15
Culture and Physical Activity	20
Acculturation and Physical Activity	23
Personal, Social Environmental, Physical Environmental	
Correlates of Physical Activity	26
Personal Correlates	26
Social Environmental Correlates	28
Physical Environmental Correlates	29
Intervention Suggestions	30
Physical Activity in Diverse Populations	30
Physical Activity and Ethnicity	31

Physical Activity in Low-Income Postpartum Women	34
Physical Activity in Older Latina Women	35
Disease Risk and Physical Activity	36
Cardiovascular Disease	36
Diabetes	37
Breast Cancer	38
Approaches to Increase Physical Activity in Latinas	40
Recruiting and Retaining Minority Women	40
Measurement of Actual Physical Activity	41
Walking Trends	41
Pedometers and Physical Activity	42
Future of Latina Physical Activity	44
CHAPTER III: MANUSCRIPT METHODOLOGY	46
Introduction	46
Methods	48
Subjects	48
Research Design	48
Physical Activity Assessment Tool	48
Physical Activity Monitor	50
Statistical Analysis	50
CHAPTER IV: MANUSCRIPT RESULTS	52
Results	52
Physical Activity Assessment Tool Findings	54
Physical Activity Monitor Findings	56
CHAPTER V: MANUSCRIPT DISCUSSION	58
Discussion	58
CHAPTER VI: DISCUSSION AND CONCLUSIONS	63

Discussion	63
Conclusions	65
REFERENCES CITED	70
APPENDIX	77
IRB Approval	78
WIC Clinic Approval	79
Physical Activity Assessment Tool: English	80
Physical Activity Assessment Tool: Spanish	87
Seven-Day Physical Activity Recall using Pedometers: English	94
Seven-Day Physical Activity Recall using Pedometers: Spanish	95
Pedometer Recall Letter	96

LIST OF TABLES AND FIGURES

TABLES

Table 2.1: During the past month, did you participate in any physical activities?	9
Table 2.2: Perceived Barriers of Physical Activity among Older Latinas	35
Table 4.1: Socio-demographic data of subjects	53
Table 4.2: Body Mass Index (BMI) of Subjects	54
Table 4.3: Subjects Levels of Physical Activity	55

FIGURES

Figure 2.1: Leisure Time Physical Inactivity	12
Figure 2.2: Prevalence of Abdominal Obesity	24

CHAPTER I INTRODUCTION

Introduction

In 2000, the United States Census Bureau made a revision of the questions regarding race and Hispanic origin to better reflect the country's growing diversity. The 1990 Census questions were changed in 2000 by the federal government to consider race and Hispanic origin as two separate and distinct concepts (1). The question on Hispanic origin asked respondents if they were Spanish, Hispanic, or Latino. While the question on race asked them to report what race or races (White, Black, American Indian, etc.) they considered themselves to be (1). According to the 2000 Census 13 percent or greater than 35 million Latinos resided in the United States (2). An update by the Census Bureau in 2002 reported that number had increased to greater than 37 million or 13.3 percent (3). In 2004, the American Community Survey, which is a nationwide survey to provide communities a fresh look at how they are changing, and is administered by the Census Bureau found the percent of Latinos had yet again increased to over 14 percent (4). It is projected by the Census Bureau that by 2050 Latinos will account for almost 25 percent of the United States population (2).

As both the terms Hispanic and Latino are used interchangeably in documentation by the Census bureau it is important at this point to make a clarification in terminology. The Office of Management and Budget define Hispanic or Latino as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race (1). The Census Bureau further describes that origin can be viewed as the heritage, nationality group, lineage, or country of birth of a person or the person's parents or ancestors before their arrival in the United States. People who identify their origin as Spanish, Hispanic, or Latino may be of any race (1). It is, however, further important to note that in actuality the term Hispanic is used

almost exclusively by the government and that term Latino is more often used by persons of Latino heritage. A further distinction between Latino and Latina needs to be made in respect to the following research. While Latinos comprise both males and females of Hispanic origin, a Latino is a male of Hispanic origin, while a Latina is a female of Hispanic origin.

With regard to physical activity it has been found that women engage in no physical activity at higher rates than men, and that minority women engage in less exercise than their white counterparts (5,6). In fact, compared to other ethnic/gender groups Latinas are the most likely to report no leisure time physical activity with low income Latinas being among the least physically active (7,8). Latinas also report no leisure time physical activity and less total physical activity in national surveys (7).

The Behavior Risk Factor Surveillance System (BRFSS) and Seven-Day Physical Activity Recall (PAR) are well known physical activity assessment tools used to track health risks across the United States and exercise science research, respectively (9). These instruments were combined to create the physical activity questionnaire used in this research. Questionnaire response and pedometer steps were examined to compare perceived and actual physical activity. Previous research conducted with low-income ethnically diverse postpartum women found the PAR was positively and significantly correlated with step counts from pedometers (10).

Glossary of terms for Physical Activity

Leisure Time Physical Activity	LTPA
Habitual Physical Activity	HPA
Physical Activity	LTPA + HPA

Intensity Levels of Physical Activity

Moderate	Small increase in heart rate/breathing
Vigorous	Large increase in heart rate/breathing
Hard	Large increase in heart rate/breathing/sweating
Very hard	Intense physical activity

Study Objectives

The goal of this study is to explore the validity of existing physical activity assessment tools with Latina mothers in the WIC program. More specifically, the goals were related to differences in reporting in physical activity assessment tools and comparisons of actual activity through the use of pedometers:

1. To determine if there are any differences in accuracy between the two physical activity assessment tools (BRFSS and PAR) that are in the combined questionnaire.
2. To measure within each tool how participants answered questions relating to physical activity.
3. To measure between tools how participants answered similarly or differently to similar BRFSS and PAR questions regarding intensity and frequency of activity.
4. To determine the level of accuracy between the actual amounts of physical activity that Latina women engage in through walking activity using pedometers.
5. To provide recommendations for modifications of physical activity assessment tools with Latina populations.

CHAPTER II REVIEW OF LITERATURE

Introduction

In 2000, the U.S. Census Bureau reported that Latinos, of any race, represented 12.6% of the total population in the United States. At this point they were still the second largest minority behind African Americans (2). However, by 2002 there were 37.4 million Latinos in the general population, and they encompassed 13.3 percent of the total population (3). It is projected that by 2010, Latinos will account for 15.5 percent of the total population and that by 2050 that percentage will jump to 24.4 percent of the total United States population (2). Latinos generally live in the Western or Southwestern parts of the United States. In 2002 Latinos accounted for 34.8 percent of the population in the South, which includes Virginia and Texas (3). While the Latino population in Virginia is relatively small at only 4.7 percent reporting to be of Latino origin in the 2000 Census, and only 1.5 percent in Roanoke city, the Latino population in Texas reported to be 32 percent, and 54.3 percent of the total population of Corpus Christi in 2000 (11,12).

In 2000, poor diet coupled with lack of exercise was the second leading actual cause of death. Of 2,391,400 total deaths in the United States in 2000, poor diet and physical inactivity accounted for an estimated 17 percent (approximately 400,000 deaths) (13). Current data indicate that the percentage of women who report no participation in physical activity is significantly higher than that for men (5). Almost 30 percent of women in the United States are not active at all, and more than 60 percent do not participate in the recommended amount of physical activity (14). Minorities, particularly women, consistently engage in less exercise than their Anglo counterparts, regardless of age (6). Women of color, women over 40, and women without a college education have the lowest levels of participation in leisure time physical

activity (15). Physical activity and inactivity patterns are important determinants of overweight and potential mediators of the immigrant generation, as well as important avenues for treating and preventing overweight (16).

While physical activity can lower the risk of diseases including cardiovascular disease, hypertension, and diabetes which all effect the Latino population, minority populations, which include Latinos, continue to be less physically active than Anglos (14). Cardiovascular disease is the leading cause of death among Latinos, and overall Latinos continue to experience a rise in coronary heart disease (17). Diabetes rates in Mexican Americans and Puerto Ricans are 110-120 percent higher then Anglos. Yet physical activity levels continue to be relatively lower in minority populations. Among five racial and ethnic groups, Latinos had the highest rates of being non-physically active in leisure time, while Anglos had the lowest (13).

Compared with other ethnic/gender groups, Hispanic women (Latinas) are the most likely to report no leisure-time physical activity (7). Latinas, particularly low-income Latinas, are among the least physically active (8). Regular physical activity has been shown to help prevent and control a variety of chronic diseases and conditions, including cardiovascular disease (CVD), hypertension, obesity, and non-insulin-dependent diabetes mellitus, which have a higher prevalence in ethnic minority populations (18). A recent review of literature suggests that CVD related diet and exercise behaviors are the most significant modifiable risk factors for Latina women (19). While the prevalence of physical inactivity during leisure time among Mexican Americans is higher than the prevalence observed in the general population, it is that physical inactivity that is a major risk factor for heart disease and other chronic diseases that disproportionately affect Latinos (20).

Forty-six percent of the Latina women reported no leisure-time activity compared with 40 percent of the African American women, and 23 percent of the Anglo women. Latinos also disproportionately bear excess health risk associated with physical inactivity, such as increased levels of obesity, diabetes, and cardiovascular disease and, more recently, breast cancer (7). Interventions are needed to reverse the trends toward increasingly sedentary lifestyles, not only to prevent breast cancer, but also to reduce the other increasing burdens of diabetes and cardiovascular disease (21). Latinas are at higher risk than non-Latina Anglo women of cardiovascular disease and stroke, primarily because of higher rates of obesity and non-insulin dependent diabetes mellitus. Increasing physical activity helps control obesity and diabetes and lowers blood pressure and cholesterol in some people (8).

Nearly four in every 10 Mexican Americans with diabetes participating in the NHANES III research indicated that they had not engaged in any leisure time activity in the month preceding data collection. More than 70 percent of those not exercising were female (22). Researchers have found that inactivity, specifically television viewing, is an important risk factor for obesity development (23). The obesity epidemic is particularly acute in many minority populations, including Mexican Americans (24). Cultural values, in which overweight status symbolizes health or wealth, supported being overweight in some women. Perhaps the cultural acceptability of an overweight image reduced the concern about obesity, because many participants equated *llenita* (being overweight) with marriage and motherhood. Some of these weight perceptions, body image attitudes, and norms of *llenita* or *gordita* (being obese), have also been described by Puerto Ricans and African Americans. Thus, some Puerto Rican and African American women are likely to experience a positive attitude toward an overweight or oversize shape, in contrast to the negative attitude often held by Euro-American women (19).

Physical Activity Assessment Tools and Latinos

Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is a population-based, random digit dialed telephone survey of the non-institutionalized United States population aged eighteen years and greater. The BRFSS is the world's largest telephone survey, and it tracks health risks in the United States. Information from the survey is used to improve the health of the American people. As it is a telephone survey and people self-report the data that is collected, it is important to remember that it is subject to recall bias (9).

The survey includes questions about health risk behaviors, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury (9). The BRFSS contained questions measuring leisure time physical activity from 1986 to 2000. As physical activity became a forefront Healthy People 2010 objective and pertinent health issue, new BRFSS physical activity questions were added in the 2001 BRFSS. The new lifestyle questions regarding physical activity classified more people as physically active than the previous 2000 BRFSS. In 2001, 45.4 percent of adults engaged in activities consistent with physical activity recommendations, versus the 26.2 percent in 2000 (25).

The 2001 BRFSS covered more domains of physical activity, including household, transportation, and leisure time. It also attempted to summarize activities in a usual week, versus the top activities of the preceding month as before. While the scope and intensity of activities increased as the number of questions regarding physical activity increased, the specific information regarding the particular activities decreased (25). Results from the 2001 BRFSS showed that prevalence of meeting physical activity recommendations decreased as age

increased, women who were active on the job were more active during non-working hours than those who were less active on the job or unemployed, that non-Latino Anglos were more active than any other racial/ethnic group, and that activity was higher among those who had at least a high school education (26).

The prevalence data for the BRFSS 2004 shows how physical activity has increased in the Latino population. When compared with the 2000 BRFSS data among physical activity, the percent of Latinos participating in physical activity has increased. As shown in Table 2.1, while the prevalence of physical activity in the Latino population is less than other racial/ethnic groups, it continues to increase with time (27).

Table 2.1

During the past month, did you participate in any physical activities?

Participated in Physical Activities
Texas—2004 vs. 2000
Response: Yes

Year:		<u>White</u>	<u>Black</u>	<u>Hispanic</u>	<u>Other</u>	<u>MultiRacial</u>
2004	% CI n	80.0 (78.4-81.5) 2946	70.9 (66.2-75.7) 350	63.2 (60.2-66.2) 1117	80.2 (73.4-87.0) 125	N/A
2000	% CI n	75.9 (74.1-77.6) 2358	72.3 (66.8-77.7) 300	61.9 (58.7-65.0) 797	73.9 (66.6-81.1) 138	N/A

BRFSS Prevalence Data Texas 2004 vs. 2000 comparison (27)

However, as there was a slight wording change between the 2000 and 2001 BRFSS questionnaire regarding physical activity, it has been suggested that the increases seen in recommended levels of physical activity may simply be a result of the expanded definition, and not a change in actual physical activity. Also, since the prevalence of inactivity between 2000

and 2001 did not change significantly (from 26% in 2000 to 27.4% in 2001) this further reduces the likelihood of actual increases in physical activity (26).

Seven-Day Physical Activity Recall

The Seven-Day Physical Activity Recall (PAR) is one of the most widely used physical activity assessments in exercise science and epidemiological research. The PAR provides detail regarding the duration, intensity, and volume (energy expenditure) of physical activity and can therefore be used for a variety of applications. The data from the PAR is often considered representative of typical activity patterns, because it utilizes a one-week time frame (28). In the recall, the participant is asked to report the amount of moderate, hard and very hard activity that they performed (only for bouts greater than 10 minutes). As a result of the detail provided in the assessment, it is also possible to estimate total daily energy expenditure. The data suggest that the physical activity recall provides useful estimates of habitual physical activity for research in epidemiologic and health education studies (29). The PAR provides a reasonable estimate of both the mean total daily energy expenditure and physical activity energy expenditure in a sample of moderately overweight, young adult men and women; however, estimates of energy expenditure on an individual basis using the PAR were found to be subject to considerable error (30).

While the PAR is the gold standard for exercise science and epidemiologic research, having valid measures to assess physical activity in diverse populations is important. As most questionnaires are designed and validated on men, they do not include the household or childcare activities that women, especially low-income women, perform. As these types of activities may cause a misclassification of activity patterns and underestimation of total daily energy

expenditure of up to 57 percent, it is important that the PAR be validated within this population (10).

Research by Wilkinson and colleagues examined the PAR with low-income ethnically diverse postpartum women. As low-income women have limited resources and face more barriers to physical activity than higher income women, valid measures of physical activity for these women, especially after pregnancy, are important. Results using the Welk algorithm found that minutes spent in sitting time, light intensity activity, total activity (sum of light, moderate, hard, and very hard activity), and energy expenditure were positively and significantly correlated with step counts using the Yamax Digi-Walker® pedometer (10).

In postpartum low-income, ethnically diverse women, the largest amount of active time was spent in light activity, and mothers averaged fewer than sixteen minutes per day in moderate and higher intensity activity time. While the new mothers did not meet the national recommendation of at least 30 minutes of moderate intensity activity on most days, the number of steps taken was higher than expected. Also, while pedometers cannot distinguish between the intensity of activity, the PAR results indicate that new mothers are active in light intensity household and other activities, but may not reach the moderate intensity level needed for health benefits. Thus, it is recommended that eliciting sitting time during PAR interviews and scoring it comparably to sleep or rest may improve the validity of physical activity estimates in sedentary populations (10).

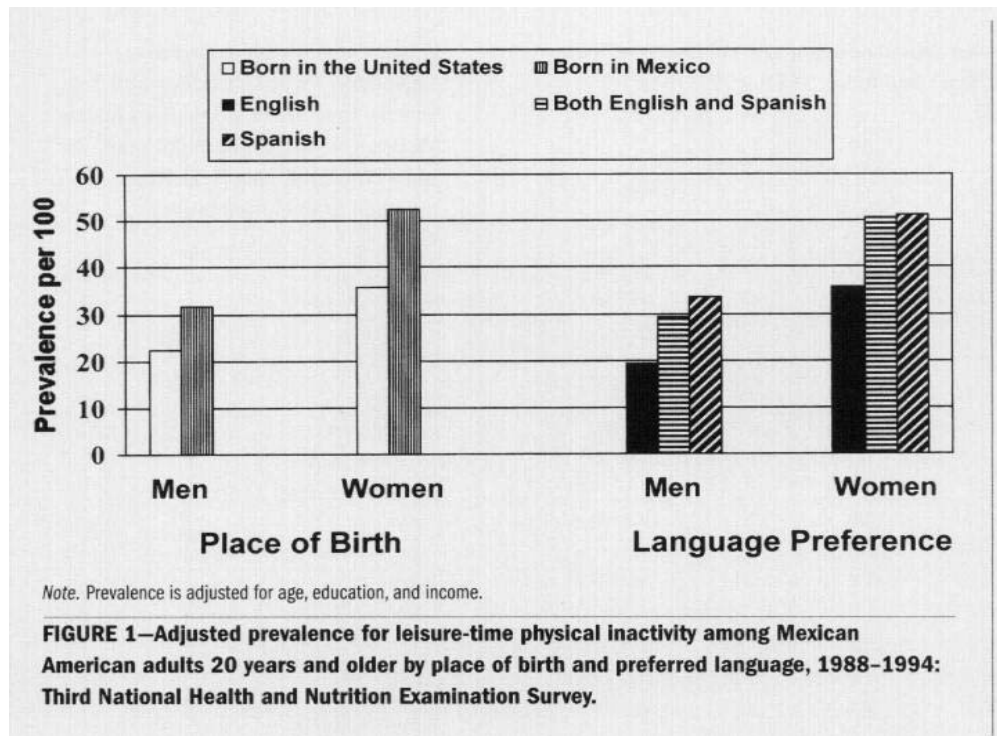
The Third National Health and Nutrition Examination Survey

The National Health and Nutrition Examination Survey (NHANES) is a population-based survey designed to collect information on the health and nutrition of the United States household population. The NHANES is conducted by the National Center for Health Statistics, which is

part of the Centers for Disease Control and Prevention (CDC). The objective of the survey is to assess the health and nutritional status of adults and children in the United States (31).

NHANES III is a multistage stratified survey of the civilian non-institutionalized population of the United States aged 2 months and older and was conducted between 1988 and 1994. Unlike other Health and Nutrition Examination Surveys, it did not have an upper age limit, and oversampled Mexican Americans, African Americans, and the very young and very old (31).

Figure 2.1 Leisure Time Physical Inactivity



Leisure time physical inactivity, Crespo (32)

The results of NHANES III regarding physical activity found that leisure time inactivity was highest among older persons, those with fewer than 12 years of education, and those who earned less than \$20,000 per year (32). As shown in Figure 2.1, it was also found that women had a higher prevalence of leisure time inactivity than men regardless of race/ethnicity, and that both Mexican American men and women had the highest prevalence of leisure time inactivity

(33). Inactivity was lower among those who spoke mostly English than non-English speakers for both men and women. Also, men and women born in Mexico had a higher prevalence of physical inactivity than US born Mexican American men and women (32).

Higher levels of physical activity at work among African Americans and Mexican Americans may explain the lack of participation in physical activity during leisure time. As NHANES III did not collect information about occupational physical activity or working conditions, only the comparison that Anglo collar workers were more active during leisure time than blue collar workers, the retired, and homemakers can be made based on the data collected (32,33).

Women who were homemakers reported one of the highest levels of physical inactivity during leisure time. The prevalence of leisure time inactivity among African American and Mexican American women who are homemakers was 48 percent and 52 percent respectively, which was almost twice that observed for Anglo women at 26 percent (33). Women who were employed or had large families were less active than unemployed or women with smaller families. Many women spend time each day doing household chores and perhaps caring for young children, which leaves little time for leisure time physical activity. Thus, individuals who perform household chores and childcare duties and hold physically active jobs may have accumulated more moderate to vigorous physical activity each day than was reported (34).

Research suggests that among Mexican Americans acculturation plays a role in influencing participation in leisure time physical activity (33). Acculturation is associated with a lower prevalence of physical inactivity during leisure time; however, it is important to remember that the results may not take into account the cultural validity of whether Latinos interpret “leisure time” differently than the rest of society (32). As such, better surveys are needed to

capture time spent performing household chores and child care activities. Also, the use of pedometers and accelerometers should be considered, as well as incorporating health education materials emphasizing active lifestyles, for Mexican Americans. Health education materials should be adapted to be culturally specific and readily available in Spanish (32,34).

Limitations of Physical Activity Assessment Tools in Minorities

Part of the reason for the difficulty in assessing physical activity levels in women by questionnaire is that they tend to engage in activities such as child care and household activities that are hard to quantify (14). Few surveys have been developed to focus explicitly on dimensions traditionally important to women, such as home chores, care giving, and community and church involvement activities. Because few surveys have captured the interest of minority women, it has been previously suggested that most survey instruments to date are not sensitive to racial/ethnic differences, and they are therefore likely to misrepresent the actual physical activity patterns of women from minority backgrounds. Latinas often feel the need to be "on call" 24 hours a day, and they typically structure their time around their families, work, and other responsibilities. As noted, existing physical activity assessment tools do not capture many of the moderately intense activities that women perform, such as household and walking activities (5,35).

When developing physical activity surveys, it is important to ensure that they are relevant for the specific target population and that terms are well defined, unambiguous, and not offensive to the participant. There are numerous definitions for terms such as "physical activity" and "exercise" and terms like "leisure time" and "sports" have negative connotations which may lead to biased responses. Specifically, the term *leisure time* generated many negative responses from participants. It was equated to inactivity or having time to oneself and not as a time to engage in

physical activity. Leisure time was considered to be a luxury that many women did not have and often many expressed feeling guilty in taking time out for themselves (5). This negative connotation for leisure or free time needs to be taken into account when researchers are creating new physical activity tools for diverse cultural and ethnic groups, including Latinas.

Participants indicated that future surveys should take into account a woman's multiple roles as the caregiver and caretaker of the home, employee, employer, wife, mother, daughter, community activist, and church member. It is also important to acknowledge and include culturally diverse activities, such as dancing, participation in religious celebrations, and community involvement in a physical activity survey as a way to improve participation and interest of respondents. New surveys need to be developed specifically for women to measure the types of activities that women perform, including household activities, walking, family care, and other activities of daily life and should make sure to include well defined terms that are not offensive to minority women (5).

Barriers to Physical Activity in Latinos

Common categories of physical activity include occupational, household, leisure time, and transportation. Individuals in the lower socioeconomic groups may tend to be more physically active than other groups because of the type of jobs they hold, such as construction work and housework. Also, since many do not own a car utilizing mass transportation requires them to walk more. Health care providers, health educators, and public health practitioners must understand how the individual behaviors, such as physical activity, are embedded in a broader context, such as culture (36).

Research has shown that even in adolescence Latino and minority females generally have lower rates of physical activity than their non-Latino Anglo counterparts (36). What is considered physical activity also needs further discussion. Eyler and colleagues (1998) found that if minority women counted all the housework they do they would fulfill the national recommendations on physical activity, but that the subjects did not feel they obtained the same benefits from pure physical activity resulting from housework compared to leisure time physical activity when they went out for the sole purpose of exercising (37).

Eyler (1998) noted that the benefits of leisure time physical activity may not just be physiological, but also contain some psychological benefits (37). In fact, social relationships and social support have been found to be crucial to influencing health behaviors and health status. Those with low levels of support are twice as likely to be physically inactive when compared with those with high support (36). The lack of a social network is a barrier to physical activity in minority women including Latinas. As Latinas migrate to a different country they are separated from family and friends, which greatly impacts the level of social support (37).

In research by Juniu and colleagues (2000), it was found that culture and ethnicity also play a role in the subjects' definition of time and work, which resulted in great decreases in physical activity. As they migrate to the United States, they feel they have to work more hours in order to survive, leaving them with less time to spend with family and for leisure activities such as exercise (38).

Another factor that is said to effect physical activity is poverty status. Poverty status is associated with an increase in physical inactivity (36). As Latino families are more likely than Anglo families to be headed by a female with no spouse present and 44 percent of Latino female headed households live below the poverty line, it can be said there is an association between

poverty status and lack of physical activity in Latina women. In fact, factors such as low levels of education, high unemployment, lack of access in general, feelings of powerlessness and hopelessness, lack of social networks, and other variables are all factors that can be related to the neighborhoods where Latinos reside and the barriers they face in adopting physical activity habits (36).

Minority women have attributed numerous barriers, such as lack of time due to family and work, lack of motivation, and being too tired to include physical activity into their daily lives. Time is the most commonly cited barrier in both ethnic minority and Anglo populations alike (18). Through research, it has been found that Latinos place a high value on health, yet despite that value, they lag behind Anglos in preventive knowledge and exercise, even with socioeconomic status controlled (39). Other common barriers are education, money, the American culture, and socio-cultural factors. Affordability, whether it is in regard to exercise equipment, facilities, or childcare, is a very real issue that can serve as a barrier to exercise (14).

Perceptions about the role women play in the Mexican American culture may present emotional barriers (i.e., guilt over the amount of time spent “just” on themselves when exercising versus time spent with the family). Although these may not be particularly unique barriers, they can be much more ingrained in the Mexican American culture (18). These guilty feelings and demands on time and responsibility consistently inhibit women from carrying out their will to diet or exercise. Also, where it may create a positive attitude and satisfaction for the woman to work out of the house, the time restraints imposed because of occupational responsibilities leave little time for physical activity (19).

Education is related to physical activity as well. For example, compared with Anglo women, African-American and Mexican-American women have proportionately: fewer college

degrees; lower incomes; higher body mass index (BMI) and higher self-reported overweight (15). Latinos aged 25 and older are less likely to have graduated from high school, and more than two in five Latinos do not have a high school diploma (3). This low level of literacy affects preferences for health education information. Minority women respond to interventions emphasizing a visual format, such as health videos and personal testimonials. In a focus group by Gettleman and colleagues (2000), minority women described the need to focus on visual versus written components (40). Women valued the videos because they could see what can happen to their health. They also wanted testimonials from ‘normal women’ to hear and learn how they changed their lives to include more positive nutrition and physical activity behaviors.

The American culture promotes decreased physical activity opportunities and increased availability of high-fat, energy-dense foods, and thus results in a higher obesity among low socioeconomic populations. Those who speak their native language and live in neighborhoods with high immigrant density may be buffered from this part of the American culture, and more often retain a healthier dietary pattern, consuming more rice (Mexicans), fruits (Mexicans, Puerto Ricans), and vegetables (Mexicans, Cubans) than their US-born counterparts (16).

It may also be possible that the ethnic differentials observed could be the result of differential reporting of physical activity and inactivity, perhaps due to cultural influences and expectations that may differentially lead to over- or underreporting of activity and inactivity (23). Few Latinas report participation in structured exercise, such as jogging, exercise classes, biking, and swimming on a regular basis. Fewer still report participation in organized sporting activities as those are generally seen as something men do. However, Latinas did report playing basketball or volleyball occasionally with their children or playing other sports infrequently at a social

event or picnic. Women did not label these activities as sports; rather they perceived these activities as part of playing with their children or socializing (5).

In a study comparing Anglo American and Mexican American women, it was found that Anglo American women's attitudes and beliefs about physical activity were that it was to help yourself in the long run, whereas Mexican Americans contemplated why they should do it at all, and tried to balance other time commitments, and the role of the family and others in beginning and continuing physical activity. Whereas Anglos named busy personal schedules as potential obstacles to enrolling or continuing in a physical activity program, Mexican Americans referred to fixed items in their schedules involving daily care of their immediate and extended family members as physical activity obstacles. Dedication to family and family responsibilities for Mexican American women drives the structure of their lives (41).

Health professionals can be an effective proponent of physical activity within the Latino community because they are authorities in the health field, and because patients respect their opinion (36). In a study conducted by Shea and colleagues, they conducted a large community-based cardiovascular disease prevention program in a predominately minority (populated mainly by Latino immigrants), urban setting. The program included multiple aspects including a marketing campaign promoting low-fat milk, exercise clubs, and a Spanish-language smoking cessation video. To address the low levels of physical activity in the Latino population the program developed volunteer led exercise clubs. The clubs were well attended, with 90 percent of club attendants Latino women. At least two-thirds of the clubs remained active for six months or longer indicating the success of this component of the program. They concluded that it is feasible to implement a complex cardiovascular disease prevention program in a socially disadvantaged urban community (42).

In discussing barriers in Latinos, some explanations may be that: minority women may be less informed about the role of physical inactivity in the etiology of chronic disease; a disproportionate number of minority women may be in lower income brackets and have less money to join a health club, buy exercise equipment, or consult with health/wellness/fitness professionals; women of color may work long and inflexible hours to support their families; and minority women may participate in more physically demanding occupational or household activity, which previously was shown to be inversely related to leisure time physical activity energy expenditure (15). If health professionals and community health programs can offer free physical activity classes and opportunities within the Latino community, as was done by Shea and colleagues (1996), various barriers to physical activity such as acculturation, as well as personal, social, and environmental factors may be able to be addressed and physical inactivity may decrease (42).

Culture and Physical Activity

Cultural and ethnic issues may effect the assessment of physical activity levels in minority subgroups. As the measure of inactivity does not address occupational activity but solely leisure time activity in several national health surveys (BRFSS, NHANES) these methodologies may lead to shortcomings altering our perception of the overall physical activity levels in many minority groups. This question wording can lead to variation in not only how the question is understood by the participant, but in the accuracy of their answer, which can lead to data that are vulnerable to misinterpretation (43). As physical activity and questionnaires are administered among ethnic/cultural groups, they need to be specific and unambiguous to prevent miscommunication between the interviewer and subject.

Culture can also affect how a participant answers a question. Participants may engage in response editing, if they are concerned with the social acceptability of their judgments, which can lead to overestimation (43). Since being active is a socially desirable trait it is possible that minorities, including Latinos, may report greater physical activity and fewer barriers either because of a lack of education, or in hopes to assimilate.

It has been suggested that older Mexican Americans perceive greater benefits of physical activity and fewer barriers to physical activity compared with European Americans, yet they are not engaging in higher levels of physical activity that improve health (44). It may be possible, however, that women in an urban setting engage in physical activity through their lifestyle, particularly if they do not have cars for transportation (8). Walking is the most common activity mentioned and it is often performed in a variety of settings for various reasons. Where some participants report walking specifically for exercise, others report walking as part of their daily activities, such as walking to the bus, walking to the corner store, walking the dog, and walking at work or during community service. It is these types of activities, as well as domestic and occupational activities, which need to be included to measure physical activity in women accurately (5).

When trying to develop a physical activity assessment for Latinas it is important to remember that the reasons for exercising often differ by race and ethnicity. Attempting to increase physical activity by promoting the prospect of weight loss may work well for Anglo women but not for Mexican-American women who cite challenge as their primary reason for participation (15). Mexican American women have also suggested that “easy access” is an important ingredient for physical activity participation and that a program held in their own neighborhood or community within easy walking distance would be very appealing (41).

Support and supportive surroundings are a consistent theme when examining activity intervention efforts in minority groups. Intervention projects implemented for African Americans and for Latino groups consistently identified community, family, and friend support as important factors influencing activity participation rates (14). Women who reported that they see people exercise in their neighborhood were more than 2.5 times more likely to meet recommendations than women who did not. Similarly, these women were 2.5 times more likely to report any activity than no activity. Also, women who reported that they attend religious services were twice as likely to meet the recommendations as were women who did not. Since seeing women exercising in the neighborhood was related to being more physically active, this suggests the importance of role models in the neighborhood (8).

Since Mexican American women are more targeted towards their families and often times do not think of themselves, a program that has been approved by the family, and husband in particular, and easily fits into daily life is more likely to be followed. It is imperative that physical activity programs are based on the values and beliefs of the individuals involved. Since home and family have been documented as important to the Mexican American culture, interventions tailored to the cultural group, as well as those that promote activity through involvement with family and peers, can stimulate interest among Latinas (22,41).

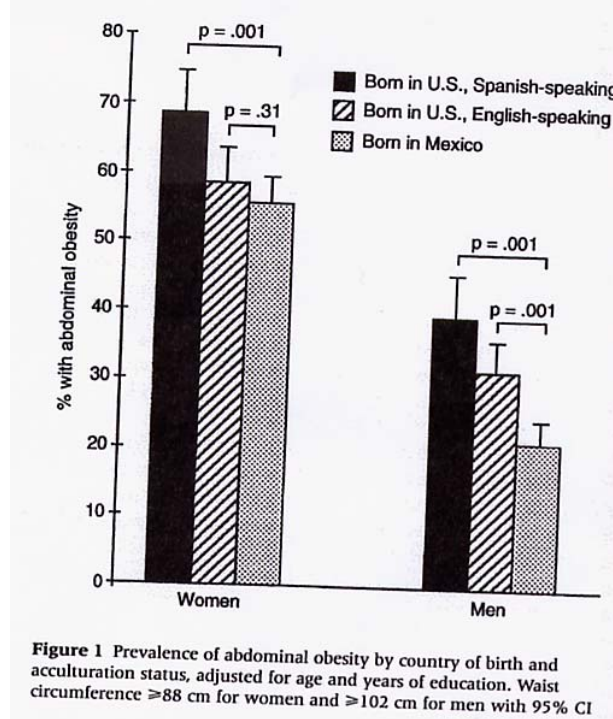
The family orientation of Mexican American women can be extended to the larger “family” afforded by their church community, which is included in their social support networks. Women who attended church were more physically active than women who did not. This finding is consistent with African-American women who stated that the physically active women were very involved in church and other social activities (8). This information suggests that working through churches may achieve the most effective results for health promotion activities.

Churches could be effectively utilized as sites not only for recruitment of participants and holding physical activity programs, but also for publicity of the physical activity programs. The church may be a suitable setting for initiating programs that provide women with the knowledge, skills, and motivation to become more active. They can then bring this information back to the larger Latina community thereby raising overall community awareness and involvement (8,41).

Acculturation and Physical Activity

Acculturation is the acquisition of dominant cultural norms by members of a non-dominant group. For Latinas, acculturation is associated with a lower prevalence of physical inactivity during leisure time. When acculturation factors are controlled, the prevalence of overweight is substantially higher among foreign-born versus US-born Mexicans. It has been found that Mexican Americans who were born in the United States or whose main language is English have a lower prevalence of physical inactivity during leisure time than their Mexican-born counterparts or than those whose main language is not English. It has also been found using the clinical marker waist circumference that country of birth for both men and women, and acculturation for women is associated with the pathogenesis for obesity. Figure 2.2 demonstrates that Mexican born men and women had the smallest waist circumference, English speaking US born men and women had intermediate waist circumference, and Spanish speaking US born women and men had the largest waist circumference (45).

Figure 2.2 Prevalence of Abdominal Obesity



Prevalence of abdominal obesity, Sundquist (45)

While both increased acculturation and socioeconomic status have been associated with decreases in obesity in Mexican American women, the effects of acculturation on obesity prevalence were stronger than the effects of socio-economic status. Thus, as immigrants become more acculturated into the American society, they become more knowledgeable about health and risk factors, and increase their physical activity, which improves their health status (16,20,46). Results shown in Figure 2.2 are consistent with findings from the Hispanic Hanes, which showed that body mass index (BMI) was larger for second and third generation Mexican Americans, and that Mexican American women with a preference for English had significantly lower levels of BMI than those with a preference for Spanish (45).

Since Latino women are among the fastest growing population in the United States, understanding the influence of acculturation on physical activity is critical to developing appropriate programs (47). Research by Evenson and colleagues (2004) looked at physical

activity and English language acculturation, 37.4 percent of participants met recommendations for moderate or vigorous activity, while 41.9 percent reported insufficient physical activity and 20.7 reported no moderate or vigorous activity. Latinas who reported higher English language acculturation and who had lived in the United States at least three years were more likely to meet recommendations for physical activity. Those who had lived in the United States longer than three years were two times more likely to meet recommendations or report any activity compared to those who had lived in the US less than three years. The researchers concluded that Latinas who scored higher on the English language acculturation scale and who arrived to the US prior to 25 years of age were more likely to report being physically active and agreed that taking care of themselves would help them stay healthy than their less acculturated and older counterparts (47).

While having health education materials that emphasize active lifestyles readily available in Spanish may help promote physical activity, Latinas have found many different ways to include physical activity into their daily lives (20). Women have developed strategies that worked for them and their families at home. Interventions that emphasize physical activity as part of an individual's lifestyle are critical to the success of exercise adoption because they help to integrate physical activity into the individual's lifestyle. Some women describe how they developed concealed strategies that included their children, such as exercising in the park or backyard when their children were playing, while others became empowered to let their families know they were going to follow heart-healthy diets and/or to exercise regularly. No matter how they obtain the activity, adherence and adapting the activity to a person's lifestyle is crucial (6,19).

Activities that do not require equipment, are unsupervised or informal, include frequent professional contact, include walking as opposed to another sport or activity, and are of moderate

intensity are most likely to demonstrate high levels of sustained participation (6). In addition to the importance of culturally appropriate, community-based programs, low-income, ethnic minority populations may respond especially well to a preparatory course taken prior to the actual behavior change intervention. Ethnic minority populations may have different cultural norms about women's health, misperceptions about exercise options for women, and a lack of familiarity with behavior-change skills needed to become more active (18).

Since females in most age groups lag behind their male counterparts in levels of physical activity participation, it is imperative that evidence-based practices in physical activity promote programs for women and girls. It is also vital that new tools for assessing fitness levels that take cultural differences into account and that provide language translations of key physical activity related terms are developed (13). By taking into account participation rates, preferences, perceived benefits and barriers, and predictors of physical activity in Latinas, the information can be used to develop promotional strategies and interventions that will increase physical activity in the future (15).

Personal, Social Environmental, Physical Environmental Correlates of Physical Activity

Multiple studies have been conducted regarding the correlates of physical activity. The evidence presented is often conflicting, but furthers the knowledge base on what effects Latinas and their physical activity habits.

Personal Correlates

In a study by Evenson and colleagues (2003), Latina immigrants who were married or living with someone were somewhat less likely to meet recommendations compared with women without partners (48). In research by Eyler and colleagues (2002), Latinas indicated that family

responsibilities were a priority in their life, and that childcare, husband care, cooking, cleaning, yard work, and other tasks left little time for exercise. The Latinas also described a theme of “familism,” which indicated that children, husband and household duties all have higher priority than interest in physical activity as the family’s health is more important than the Latina woman’s (49).

Women who reported excellent or very good health were somewhat more likely to meet recommendations or to report any activity as compared with those in fair or poor health (48). However, in research by Voorhees and colleagues (2003), however, there were no significant relationships found between activity level and personal influences (7). Several trends were found that indicated that women with some college education or college graduates were more likely to meet physical activity recommendations; younger women were less likely to be active compared with older women; women who had higher levels of income, were employed, or were partnered were less likely to be active; and women who had no children living in the house were more likely to be active (7). When women were asked reasons why they did not exercise more frequently cited reasons included: not having enough time (38.4%); having low self-motivation or willpower (21.4%); and being too tired or not having enough energy (14.0%) (47). Lack of time was often cited because of the Latina’s responsibility to take care of the family and household. In a study by Evenson and colleagues (2002) women who worked stated that when they arrived home they were expected to cook and take care of the children, leaving little time for themselves (50).

The personal correlate that was most consistently and strongly associated with physical activity was exercise self-efficacy. Among Latinas that were confident in their ability to exercise, there were up to five times more likely to be active or meet physical activity

recommendations than women who reported low self-confidence (51). In research by Wilbur and colleagues women who were somewhat confident they could exercise were nearly six times more likely to report any activity than women who were not at all confident that they could exercise more (8).

Social Environmental Correlates

The social environment includes interactions with family, friends, coworkers, and others in the community (52). It encompasses social institutions such as schools, the workplace, places of worship, housing, public transportation, and the presence or absence of violence in the community. The social environment can play an important role in physical activity among Latinas. Knowing people who exercise was significantly and positively correlated with doing any physical activity in Native Americans, Latinas, and rural African Americans (51). Latina immigrants who knew people who exercise or observed people exercising in their neighborhood were much more likely to meet recommendations or report any activity (48). Women who reported that they see people exercise in their neighborhood were more than 2.5 times more likely to meet recommendations than women who did not, as well as were 2.5 times more likely to report any activity than no activity (8). Also, women who reported they attended religious services were twice as likely to meet the recommendations as women who did not (8).

However, in one study women were significantly less likely to be active if they reported knowing people who exercise, if they reported there are people in their neighborhood who exercise, if they belonged to a community group, or if they attended religious services (7).

Social support also includes support from family, friends, and spouses. Women also mentioned that help could motivate and support an exercise routine, as well as friends and family could serve as exercise partners for motivation and camaraderie (49). While lack of support

from the husband can discourage physical activity as participants have said men do not value physical activity for their wives, finding support from other family and friends to help with childcare and encouraging physical activity can increase incidence and likelihood of physical activity among Latinas (50).

Physical Environmental Correlates

The physical environment is that which can be heard, seen, touched, smelled, and tasted, and it can harm individual and community health or promote good health (52). Eyler and colleagues (2003) found few environmental correlates associated with physical activity level (51). Evenson and colleagues (2003) also found no strong associations between physical environment and physical activity. Participants did note that speeding drivers, heavy traffic, and unattended dogs might keep them from exercising, but having sidewalks was only weakly correlated with activity. However, having access to indoor or outdoor places to exercise was more strongly associated with any activity (48).

Voorhees and colleagues (2003) found none of the physical environmental correlates were significantly related to activity recommendations, but several trends were noted. Trends included women were more active if vehicular traffic was light, and if they perceived the neighborhood was free from crime. However, women who reported having places within walking distance and having places to exercise within the neighborhood were less likely to be active (7). Wilbur and colleagues (2003) reported only one physical environmental correlate was significant, which was that when women who reported some activity were compared with those who reported no activity they were less likely to be active if traffic was light than if it was heavy in their neighborhood (8).

Eyler and colleagues (2002) reported safety concerns as reasons for not being active in the physical environment. Urban women were concerned with being harassed by homeless persons and drug dealers or of being victim of a drive by shooting, while rural women were concerned about being harassed by strangers and were afraid to walk on roads without sidewalks. Both populations cited fear of being attacked by dogs as an impediment to physical activity (49). Evenson and colleagues (2002) cited lack of facilities and sidewalks to get to facilities as barriers, as well as dependency on their husband to drive them or public transportation, as well as the need to increase the safety at existing outdoor parks (50).

Intervention Suggestions

When asked how to overcome the personal, social environmental, and physical environmental correlates that prevent their physical activity, Latinas came up with various suggestions. The most common change suggestion across the groups had to do with facilities. More facilities, more convenient facilities, facilities specifically for women, and financially available facilities were all suggestions (7,8,48,49,50,51). For the working Latina, suggestions included on-site facilities, more flexible work schedules, increased break time to allow time to be active, and to have exercise equipment and company sponsored facilities available at work (7,7,48,49,51).

Physical Activity in Diverse Populations

The diversity of a population can vary not only by race, gender, or ethnicity, but also by social class, age, and cultural values. These diverse populations illustrate all of these differences that are evident both between and within different ethnicities.

Physical Activity and Ethnicity

Evaluating physical activity across diverse populations allows direct comparison between what are barriers, motivating factors, and cultural norms that influence physical activity. In a study by Berg and colleagues (2002), comparisons were made between Anglo American and Mexican American women. They found that motivating factors were different among the two groups with helping yourself in the long run cited as a reason for engaging in physical activity, while barriers for Anglos included physical limitations due to illness, injury, or lack of talent, as well as the need for formal groups for motivation and the necessity of an activity to be enjoyable to encourage participation (41).

In Mexican American women the beliefs shared were why do it at all, along with individual motivators, and barriers including forces influencing decision, other time commitments, and the role of the family in beginning and continuing physical activity. Mexican American women described that improved health through physical activity was thought of as a prescriptive therapy for illness or condition, for restoring or improving poor health rather than health promotion or disease prevention. Individual motivators for participation included better sleep, more energy, and feeling better physically. Forces that influenced the decision include feeling too old to engage in physical activity, lack of transportation, and cost. Women also cited that their duties to others in the family and with the church take a large time commitment. Interestingly, Mexican American women described that they planned their day around watching *telenovelas* (soap operas). The family also influences the onset and continuation of activity, and support from family, especially husbands determine ability to participate (41).

In comparing these groups the most striking contrast was the Anglo focus on individual characteristics, benefits, and motivators, while Mexican Americans focused on motivation, and

approval from family members. Dedication to family drove the structure of the Mexican Americans' lives. Possible avenues for intervention with Mexican American women include promoting physical activity in a church setting through church sponsored social functions (41).

A second study conducted by Sallis and colleagues (2001) recorded longitudinal changes in physical activity among Mexican American and European American women. They recorded data on physical activity at baseline, then seven years later. Results showed that while several components of total physical activity by intensity and context did not track well, moderate work was the one activity component that tracked significantly for Mexican American women. It was the only category at baseline that Mexican American women were higher than European Americans, which is consistent with occupational activity. At baseline the European Americans reported more vigorous leisure activity and Mexican Americans more moderate activity. Seven years later, there were no differences among the two groups on any physical activity variable. The only variable that correlated with increased physical activity was Mexican Americans increase in hours worked per week. Researchers concluded that as children grew older and required less supervision Mexican American women spent more time at work (53).

A study by Ransdell and colleagues (1998) compared a tri-ethnic population of Anglo, African American, and Mexican American women. For household activity energy expenditure African American and Mexican American women expended a larger proportion of their 24-hour energy expenditure as household energy expenditure at 60 percent and 59 percent respectively as compared to 45 percent for Anglo women. While no differences were found in weekly and yearly estimates of leisure time physical activity, there was an inverse relationship between years of school and leisure time physical activity. Women without a college degree were more likely to be sedentary and less likely to be highly active than women with a college degree. For

African American and Anglo women maintaining or losing weight was the most frequently cited reason for exercising, while in Mexican American women challenge was the reason for exercising. In both African American and Mexican American women social support was a predictor of leisure time physical activity. Spousal influence on vigorous leisure time physical activity was also higher for Mexican American women than Anglo women. Marital status was the most important predictor of leisure time physical activity in minority women (15).

A study by Sanchez-Johnsen and colleagues (2004) among African American and Latin American women found that more than half of the participants denied engaging in physical activity, the majority denied attending organized weight loss programs, and more than half reported that weight and shape were not very important and did not play a part in self-evaluation. Among the women who did report engaging in physical activity, Latin American and African American women did not differ in the number of times exercised per week, number of minutes spent exercising, or perceived physical exertion during exercise. A significant finding between the two minorities, however, was the significantly larger body image and greater body discrepancy of Latin American women versus African American women. Although Latin American women weighed less than African American women, they perceived their current body image as heavier and reported greater body dissatisfaction than African American women who preferred a larger body type (54).

A final article comparing physical activity among diverse populations looked at the perception of lack of time in African American and Latina women. Heesch and colleagues (2004) found that the number of days a participant met the national physical activity guidelines was positively associated with perceived lack of time. More active participants were less likely to perceive time as a barrier to being physically active. The main finding was that a participant's

perception of lack of time was not influenced by the number of minutes she spent taking care of her work, home, and other responsibilities. It suggests that the perception of lack of time does not reflect actual time commitments, and thus lack of time is generally an excuse rather than a true reason for not being physically active. The article went further to say that most women have approximately 28 hours of leisure time available per week which they spend doing sedentary activities rather than being physically active (55).

Physical Activity in Low-Income Postpartum Women

Valid measures of physical activity are important for all diverse populations. Questionnaires have been historically created and tested with men, which can affect the validity of results for women. Physical activity questionnaires that are not adapted for women may not include household or child care activities that are a large part of the activity a mother may receive. It is possible that if a physical activity assessment tool does not include these activities, that are common activities of daily living mothers engage in, that they may misrepresent the level of physical activity and thus energy women expend (10). In a study by Wilkinson and colleagues (2004) they tested the validity of the PAR with low-income women and validated the level of physical activity through pedometers. It was found that the largest amount of postpartum mothers' activity was in light intensity activity; and that sitting time, light activity, total activity, and total energy expenditure measured by the PAR was significantly related to actual step counts (10). While the postpartum mothers did not meet recommendations for physical activity for moderate or higher intensity activity, the results did demonstrate the value of using the PAR with pedometers to validate physical activity assessment tools.

Physical Activity in Older Latina Women

Mouton and colleagues (2000) found that older Mexican Americans perceived fewer barriers to physical activity and greater benefits of physical activity than older European Americans, yet participate in less physical activity than their European American counterparts (56). While older Latinos had positive attitudes regarding physical activity and its ability to improve health, various reasons prevent older Latinos from exercising. Participants in a study by Melillo and colleagues (2001) found that participants wanted “places to come together as Latinos, speak their own language and be taught the importance of exercise in their own language” (57). Other barriers cited by participants included time constraints and roles as a woman, personal health concerns, internal factors, and external factors.

Table 2.2: Perceived Barriers of Physical Activity among Older Latinas

<i>Perceived Barrier Theme</i>	<i>Description and Characteristics</i>
Time constraints and women's roles	Caregiving: partners/spouses, grandchildren, other family members Occupational roles Spousal and maternal roles
Personal health	Chronic disabling illnesses: hypertension, diabetes, peripheral vascular disease, arthritis, back injury, chronic pain, orthopedic limitations
Internal factors	Lack of determination: <i>flojera</i> (sluggishness), <i>desidia</i> (neglect), <i>pereza</i> (laziness), <i>haraganeria</i> (idleness) Lack of motivation: tiredness, lack of energy, fatigue, chronic health problems, lack of family and spousal support, due to health, lack of energy and fatigue
External factors	Transportation, community safety, cost of facilities, weather, distance to fitness facilities

Perceived Benefits and Barriers, Juarbe (44)

Table 2.2 describes the multiple roles that demand time in older Latinas' lives. In the role of caretaker, the older Latina feels she has obligations to her work, family, and other volunteer roles before engaging in physical activity (44). In personal health participants are concerned that physical activity can hurt them if they have asthma or heart disease (57). Internal

factors range from lack of spousal support to be physically active, to the lack of determination and even deeper seeded cultural sentiment that exercise and physical activity is inappropriate in older age (44,57). Finally, external factors such as cost, and not having access to a “place of their own,” such as a gym or a place to walk, were barriers to physical activity in older Latinas (44,57). It is necessary that the promotion of physical activity in this population focus on the benefits available to older Latinas. Not only can exercise improve health help to improve the quality of life making you feel more “capable, despite age,” but it can help improve the older Latinas ability to focus on family roles (57). Physical activity can also help older Latinas manage disease, promote mental health, and improve physical performance (44). It is the perception of benefits to barriers that must be overcome to encourage the initiation of physical activity and help prevent further disease risk in this population.

Disease Risk and Physical Activity

Cardiovascular Disease

Cardiovascular disease is the leading cause of death among Latinos, with mortality rates for women similar to the rates among non-Latino Anglo females. Hypertension is a precursor to coronary heart disease, which is the leading cause of death among women in the United States. Physical inactivity is another risk factor for this disease (58). Physical activity has been previously shown to be effective in the management of hypertension and can lower blood pressure (17). Results from Goslar and colleagues (1997) indicated that Mexican American women’s non-recreational activity involving frequent arm and leg movements was associated with lower systolic, but not diastolic, blood pressure measurements (17).

Research from Afghani and colleagues (2004) demonstrated that higher levels of fitness were associated with more favorable risk factors for cardiovascular disease. They found that higher levels of aerobic capacity were associated with lower levels of body mass index, waist circumference, systolic and diastolic blood pressure, and glucose. This suggests that if physical activity is used as a tool for reducing hypertension, atherosclerosis, and coronary disease it must be accompanied by weight loss ideally abdominal weight loss. The results demonstrate in Latinos that age and waist circumference are important predictors of blood pressure and can be influenced by aerobic fitness (58).

Diabetes

Physical activity is one of a few modifiable environmental risk factors that could be related to the risk of non insulin dependent diabetes mellitus (NIDDM) (59). In a study by Kieffer and colleagues (2002) Latino women gave their perspectives on various health conditions, one being diabetes and physical activity. There was considerable disagreement about the role of physical activity in causing diabetes. Many women did not believe a relationship existed because dietary factors were seen as the primary cause. Those that saw lack of exercise as a contributing factor did not view it as a cause or preventive strategy, but as part of the treatment (60).

Data presented by Fulton-Kehoe and colleagues (2001) suggested that persons with higher levels of physical activity were 25-50 percent less likely to have NIDDM. Also, lower levels of work and leisure activity were similarly associated with NIDDM in both Latino and non-Latino subjects with a stronger association in Latino subjects for each measure of activity. Even after adjustments there was a consistent doubling of risk of diabetes among Latino subjects. Thus, the level of physical activity did not appear to explain the Latino excess of NIDDM in the

population. It is also possible that the amount of activity was altered by NIDDM as some subjects may exercise less because of the perception of illness (59). Another study regarding leisure time and Latinos by Wood (2004) found that 39 percent of Latinos with diabetes reported no participation in leisure time activity during the collection period (22). Also, more women did not exercise than men at 45.5 percent and 28.8 percent respectively. It is possible that employment and family responsibilities limit time available for leisure activities. It is important that culturally appropriate health care that addresses the cultural differences among Latinos can be implemented to help address health promotion and disease prevention (22). A final study regarding diabetes and specifically impaired glucose tolerance by Regensteiner and colleagues (1995) found that with higher levels of physical activity the insulin area was lower. Results found that a 30 metabolic equivalent (MET) increase in activity was associated with a decrease in insulin area. That increase can be accomplished by incorporating an hour of brisk walking each day into the daily routine. The researchers concluded that physical activity has a role in preventing the development of diabetes and that strategies to increase physical activity associated with daily routine may be both practical and optimal methods to help preserve good health (61).

Breast Cancer

Considerable amounts of data have accumulated supporting the lowered risk of breast cancer among physically active women. Breast cancer is the most common cancer among Latino women, and is a leading cause of cancer mortality. Results from John and colleagues (2003) concluded that the lifetime averages for total activity from all sources was highest among Latina controls, and lowest among Anglo women. The Latinas spend significantly more time with strenuous household chores than Anglos and less time with recreational activity than either African Americans or Anglos. In postmenopausal women time spent on moderate and vigorous

activity was comparable among all three ethnicities. Their results show that occupational physical activity is associated with a reduced risk of breast cancer both among pre and postmenopausal women (62).

Evidence indicates that women who are the most physically active have substantially reduced risk of breast cancer, especially those who participate in vigorous physical activities. Gilliland and colleagues (2001) found that among Latino and non-Latino Anglos the five most commonly reported non-occupational activities were housework, walking, heavy outside work, biking, and dancing (21). Latinas reported a greater number of activities and total weekly hours of activity than Anglo women. Higher levels of vigorous physical activity were associated with substantial reductions in breast cancer risk in both Latina and non-Latina White women. Increases in amounts of vigorous activity were associated with greater reductions in risk (21).

The larger protective effect of physical activity for Latina than non-Latina resulted primarily from ethnic differences in the protective effect among pre-menopausal women. Among postmenopausal women high levels of vigorous activity were associated with approximately 50 percent reduction in risk in both ethnic groups. As Latinas have a higher prevalence of obesity and relatively greater intra-abdominal fat than do non-Latina White women, the effects of physical activity may be greater among Latinas. It was also concluded that associations with physical activity and breast cancer risk is independent of body mass index and energy intake (21). These reports on disease risk in Latinas and the association with physical activity substantiate the need for interventions to reverse the trends toward increasingly sedentary lifestyles not only to prevent breast cancer, but also to reduce the increasing burdens of diabetes and cardiovascular disease.

Approaches to Increase Physical Activity in Latinas

One approach to reduce health disparities in underserved communities is to work with lay health advisors, also known as lay health educators, lay health advocates, peer advisors, or *promotoras*. As the lay health advisor can have an intimate understanding of the community's socio-cultural background, experiences, challenges, and strengths, they are uniquely qualified to provide peer support for community members (63). As there is a need for information that quantifies activities performed by women, especially minority women, it is important that physical activity assessment tools include activities performed as part of occupation, home chores, and care giving. It is also necessary to understand how minority women define physical activity related terms and to document activities that may be culturally or gender specific. Further techniques are needed to improve recall of unstructured and intermittent physical activities that women take part in such as household chores, walking, family care, and other activities of daily life (5). If improvements in survey cultural sensitivity could become incorporated it would likely improve the ability of researchers to effectively assess physical activity in minority populations including Latina women.

Recruiting and Retaining Minority Women

To study physical activity in Latinas it is first important to gain their interest in participation. While mass mailings, local media, referral and community outreach all gain participants at different levels of success, face-to-face interactions result in the highest proportion of eligible women participating (64). It is important for successful recruitment of this population to provide benefits to the participants, and involve the community in planning the intervention. To improve participation, conduct the study at a location convenient to the target community, as transportation is often a barrier in this population. A site within the community

will also enhance the trust of potential participants (64). It is also important to stay in contact with a representative of the community as they can help you access other participants, as well as contact with community agencies who have previous experience working with the target population. Match interviewers to language and ethnicity of target population if possible, and keep in close contact with participants to prevent attrition (64). Lastly, it is important to compensate participants for time spent in a research study and provide feedback to encourage them to adopt healthy lifestyles such as increased physical activity.

Measurement of Actual Physical Activity

Walking Trends

Walking as a leisure time physical activity has increased modestly especially in subpopulations, between 1987 and 2000. The data from the BRFSS shows that the largest increases in physical activity were in populations that generally had low levels of physical activity such as older people and minorities (65). Specifically the Latino population the percentage of adults who walk for leisure time physical activity has increased from 31.2 percent in 1987, to 37.6 percent in 1994, and finally 39.9 percent in 2000, showing an almost nine percent increase in walking as a physical activity in this population (65).

Walking either by itself or in combination with another type of activity is always the most common cited activity for meeting physical activity guidelines. The factors such as low cost, easily accessible, low risk for injury, and its ability to promote weight loss and weight maintenance all justify the popularity of walking (65). To promote walking for physical activity to sedentary individuals it is important to explain that moderate, less intense activity has better adherence among individuals in the long run, and is more easily maintained across the lifespan

than vigorous activities, which decrease with age (6). Research in Australia has shown that women who are homemakers may not engage in the high levels of sedentary behaviors we attribute to them. Brown and colleagues (2003) looked at sitting time as it related to work, and found that those who were homemakers reported the lowest levels of total sitting time. Results showed that ‘workers’ spent approximately six more hours per day sitting than mothers of young children (66).

To begin a walking program, encourage a low-intensity program to previous sedentary individuals, as low-intensity can still positively affect cardiovascular risk factors. It has been found that 10 minutes of physical activity several times throughout the day provide similar health benefits to one continuous session (6). Hultquist and colleagues (2005) further discuss types of walking and the effects different instructions can have on walking distance and intensity (67). Hultquist compared instructing subjects to walk briskly for 30 minutes a day on most days of the week, to having participants wear a pedometer and work to achieve 10,000 steps per day. Her results showed that when instructed to walk a certain number of steps per day the participants accumulated more total walking than simply being told to walk for a length of time. While pedometers do not address the issue of intensity, this type of physical activity monitoring allowed the women to accumulate steps in ways that fit into their lifestyles (67).

Pedometers and Physical Activity

A pedometer is a non-invasive tool that allows for feedback on a person’s activity level. Pedometers are typically worn on the belt and respond to the vertical accelerations of the hip during walking. The accuracy of step counters has received some scrutiny, as there is a need for standardization to ensure classification of activity level is appropriate. While pedometers are limited to ambulatory activity and cannot measure swimming, weight lifting, or cycling, as

walking is the most common activity pedometers can measure the accumulation of physical activity through walking (68,69). A comparison of 13 different pedometer models by Schneider and colleagues (2004) compared the accuracy of each in free-living conditions. The Omron HJ-105 was included in this study, and was found to overestimate step counts. However, that could be a result of a higher level of sensitivity with the Omron pedometer than the criterion model (Yamax SW-200). It may also differ in the vertical acceleration threshold required to trigger a step in the pedometer itself (68).

Tudor-Locke (2005) and colleagues used pedometers to determine the number of days necessary to accurately predict weekly physical activity. It was found that a minimum of three days of pedometer data is sufficient to estimate physical activity in a week (70). Participants averaged 6838 +/- 3643 steps per day over seven days of monitoring, with no significant differences between genders. Sunday, however, was statistically significant in fewer steps than all other days of the week (70). A similar study compared questionnaire responses with pedometer step counts, and found that participants underestimated their daily walking distance. Women tended to accumulate 6413 +/- 2267 steps per day and again subjects took fewer steps on Sunday than on other days of the week (71). Women tended to underestimate walking distance more than men. The wording of the questions or the lack of ability to remember non-structured activity could have affected the accuracy of participants walking recall (71).

The final notion regarding pedometers is whether they affect physical activity. If participants are given pedometers as a tool for exercise, does it increase activity levels? Rooney and colleagues (2003) found that following two years compliance was higher in lifestyle activity groups versus structured traditional exercise programs and that lifestyle was as effective as traditional at improving physical activity, fitness and cardiovascular risk (69). Throughout the

program women who set goals for themselves had improvements in self-efficacy; increased energy, improved muscle tone, lost weight, clothes fit better, and less stress. Women also commented that just having the pedometer made them more aware of daily physical activity and that just wearing the pedometer made them want to be more active. Women who wore the pedometers were also more likely to reach 10,000 steps per day than those who did not wear the pedometer all of the time (69). While there is some criticism about pedometers and the lack of standardization between models and brands, the improvements that are made in physical activity in simply wearing a pedometer show the benefit this physical activity assessment tool provides. Pedometers help participants easily measure their own physical activity level, and can be used on a long-term basis to continually monitor and increase activity levels in the greater population.

Future of Latina Physical Activity

There is a need for information that quantifies the activities performed by women, especially minority women. Tools that measure activity performed as part of the occupation, home chores, and care giving all need to be assessed to accurately document actual levels of physical activity women engage in. There is also a need for clarification among physical activity terms among minority women. Tools that are sensitive to the negative connotations associated with the words ‘sports’ and ‘leisure time’ will more accurately assess Latina physical activity (5). As literacy is an issue within this population, the need for visual instead of written assessments may need to be pursued, as well as the increased use of *promotoras* within this population (40,63). If a lay health advisor, a *promotora*, of similar socio-cultural background to the population promoted physical activity to Latinas, that person is in a unique position to provide peer support and encourage physical activity (63). Techniques to help Latinas improve recall of unstructured and intermittent physical activities would also improve researchers’ ability

to assess recent physical activity recommendations (5). Thus it is necessary to reevaluate physical activity assessment tools and their validity with women, specifically Latinas. If research shows physical activity assessment tools do not accurately assess actual physical activity within the Latina population, it is important to promote the development of culturally sensitive tools that are meaningful to women, specifically Latinas; short in length to encourage participation; and easily understood by respondents to overcome literacy and language barriers (13,72).

CHAPTER III MANUSCRIPT METHODOLOGY

Introduction

Regular physical activity can lower the risk of diseases including cardiovascular disease, hypertension, and diabetes which all disproportionately effect the Latino population (14,17,18). While the link between physical activity and health is known, Latina women (Latinas) are more likely, when compared to other ethnic/gender groups, to report no leisure-time physical activity and report less total physical activity in national surveys (7,22). This could be in part due to cultural differences in perceived activity. Other studies have reported a disconnect between perceived activity as measured through physical activity assessment tools and actual activity, and the ability of questionnaires to measure this difference (7). The amount of moderate to vigorous physical activity accumulated may be higher than was reported for Latinas who perform household chores, childcare duties, and hold physically strenuous jobs (34). Physical activity assessment tools should take into account a woman's multiple roles as a caregiver and caretaker of the home, employee, employer, wife, mother, daughter, community activist, and church member (5).

Part of the reason for the difficulty in assessing physical activity levels in women by written survey instruments is that women tend to engage in activities such as child care and household activities that are hard to quantify (14). As a result, physical activity assessment tools do not capture many of the moderately intense activities that women perform such as household and walking activities (5,35).

Physical activity assessment tool wording can lead to variation in not only how the question is understood by the participant, but in the accuracy of their answer, which can lead to

data that are vulnerable to misinterpretation (43). It may also be possible that the ethnic differences observed could be the result of differential reporting of physical activity and inactivity, perhaps due to cultural influences and expectations that may differentially lead to over- or underreporting of activity and inactivity (43). Eyler and colleagues (1998) found that if minority women counted all the housework they do, they would fulfill the national recommendations on physical activity, but that the subjects did not feel they obtained the same benefits from pure physical activity resulting from housework compared to leisure time physical activity when they went out for the sole purpose of exercising (37).

The Latino population is the fastest growing minority population within the United States. It is projected by 2010 they will account for 15.5 percent of the total population and by 2050 that percentage will jump to 24.4 percent of the total United States population (2). Positive health behaviors such as physical activity must be accurately assessed to begin to ameliorate the disproportionate health risks that this population faces (2,3). This study aims to explore the validity of existing physical activity assessment tools. Two commonly used physical activity assessment tools (Behavioral Risk Factor Surveillance System and Seven-Day Physical Activity Recall) were used to examine the relationship between reported levels of physical activity and 7 day recalls of actual activity using pedometers.

Methods

Subjects

Fifty-five self-identified Latina females between the ages of 18 and 50 years volunteered to participate in this study. All subjects were mothers that had at least one child under the age of five living at home, were not currently pregnant, and participated in the Special Supplementary Program for Women, Infants, and Children (WIC) program. Subjects were recruited from the Corpus Christi, Nueces County WIC clinic by poster advertisement and researcher interaction. Before participation each participant read and understood participation was voluntary and that completion of the survey was implied consent. All procedures were reviewed and approved by the Institutional Review Board at Virginia Polytechnic Institute and State University.

Research Design

The project was performed in two major stages. First, the questionnaires were developed, translated, and administered to Latina participants. The questionnaires were pilot tested with a similar audience and then administered at the WIC clinic that is part of the Nueces County Health Department in Corpus Christi, Texas. Finally, the Latinas that participated in the administration of the questionnaire were asked to wear a pedometer for seven days and record the number of steps taken each day to assess actual level of physical activity. Once the participants completed their physical activity (pedometer) recalls they returned the pedometer recalls securely by stamped envelopes to the researchers.

Physical Activity Assessment Tool

The physical activity assessment tool used in this study combined two well-known assessment tools: the Behavioral Risk Factor Surveillance System (BRFSS) and the Seven-Day

Physical Activity Recall (PAR). BRFSS tracks health risks in the United States among adults and the results of the survey are used to improve the health of the American people and guide statewide and national programming. The BRFSS attempts to cover the domains of physical activity, including household, transportation, and leisure time and summarizes activities in a usual week (9). The BRFSS has been adapted over the years to not only include questions measuring leisure time physical activity as was done from 1986 to 2000, but to include new lifestyle questions regarding physical activity (9).

The Seven-Day PAR is one of the most widely used physical activity assessments in exercise science and epidemiological research. Previous research has examined the PAR in comparison with pedometers with low-income ethnically diverse postpartum women and found that minutes spent in sitting time, light intensity activity, total activity (sum of light, moderate, hard, and very hard activity), and energy expenditure were positively and significantly correlated with step counts using a pedometer (10).

The combined questionnaire that was administered in this study merged the BRFSS with the PAR. Findings from the combined questionnaire were measured both within each tool, such as how participants answered questions among all BRFSS questions, and also between tools comparing how participants answered similarly or different to similar BRFSS and PAR questions. Levels of physical activity were determined in accordance with the US Surgeon General recommendations that individuals accumulate 30 minutes of at least moderate intensity activity on a daily basis (18). Thus, in this research the standard for physical activity was set at 30 minutes each day of the week, or 3.5 hours per week of at least moderate intensity physical activity. The resulting combined physical activity assessment tool was used to help determine which questionnaire, or parts of each were valid in accurately assessing physical activity in

Latinas, and provide recommendations for modifications of physical activity assessment tools with minority populations. The questionnaire was administered in the waiting room of the WIC clinic as clients waited for their appointments. Subjects filled out the combined physical activity assessment tool with no instruction or clarifications from the researcher.

Physical Activity Monitor

In addition to the perceived activity measures that were collected through the use of the questionnaires actual physical activity was monitored by using pedometers. Subjects were instructed to wear the Omron HJ-105 pedometer during all waking hours, except when in water. Subjects were to wear the pedometer for a total of seven days and record the total number of steps taken each day on a physical activity Seven-Day Walking Recall. Walking volume was computed as the average number of steps taken across seven days.

Subjects were shown the appropriate pedometer placement on the waistband at hip level and level to the ground. Before putting the monitor on each day the subjects were instructed to make sure the pedometer was reset to zero, and at the end of each night subjects recorded the number of steps displayed on the pedometer for that day. Subjects also recorded specific activities they participated in during each day as well as work hours if applicable.

Statistical Analysis

All statistical analyses were carried out using SAS version 9.1 for Windows (SAS Institute Inc. Cary, NC). For all analyses, an alpha value of $P < 0.05$ was used to denote statistical significance. Questionnaire data were coded so that if a participant had reported a favorable response to a question the response was coded as a 1; if the participant was inactive or responded negatively to a question the response was coded as 0. Step counts were averaged to yield a

measure of mean steps per day for each subject. A variety of statistical tests were performed. Chi-square tests (Fisher's exact tests, specifically, for tests with small cell sizes) were used to examine difference in subject response between the BRFSS and PAR. These differences in reporting were examined comparing BRFSS moderate to PAR moderate, BRFSS vigorous to PAR Hard, and BRFSS vigorous to PAR Very Hard activities. A stepwise regression was used to determine which demographic factors were significant variables for levels of physical activity, such as number of children and age.

CHAPTER IV MANUSCRIPT RESULTS

Results

Table 4.1 presents the socio-demographic data of the women who participated in the study. All were low-income based on the selection criteria of participation in the WIC program. The women ranged in age between 18 and 50 years old, with a mean age of 26 years. All considered themselves to be Latina, and all had been born in this country and were therefore considered at least second generation immigrants. All spoke and read both English and Spanish but all preferred using questionnaires that were available in English (as they were available in both English and Spanish), indicating a higher level of acculturation.

Almost half of the women in the study (43.7%) fell into the youngest age range. Greater than 85 percent of the subjects had a high school degree or less. The subjects also tended to have multiple children: almost half (43.7%) had three or more children and greater than three-fourths (76.4%) of the subjects had at least two children.

Table 4.1

Socio-demographic data of subjects (n=55)

Characteristic	Number of Subjects	Percent
Age (years)		
18-24	26	47.3
25-30	16	29.1
31-40	10	18.2
41-50	3	5.5
Marital Status		
Married	22	40.0
Not Married	33	60.0
Birthplace		
Corpus Christi	37	67.3
Other	18	32.7
Education		
< High School	24	43.6
High School	23	41.8
2 year Associate Degree	1	1.8
Beyond High School (Some College)	6	10.9
College Degree	1	1.8
Employment		
Not Employed	31	56.4
Part-time	11	20.0
Full time	13	23.6
Number of Children		
1	13	23.6
2	18	32.7
3	14	25.5
>3	10	18.2

Further data were collected about subjects' perceptions of their own health including self-determined height and weight information. Table 4.2 displays the body mass indices that were calculated based on the height and weight data reported. From these calculations, greater than 50 percent of the population fit into the normal or overweight status with 19.2 percent within their correct height for weight ratio, and 36.5 percent considered overweight (73). It was also found that 44.2 percent of the subjects were in "obese." Greater than 80 percent (80.7%) were either overweight or obese, and no subjects reported underweight.

Table 4.2

Body Mass Index (BMI) of Subjects (n=52)

BMI Category	Number of Subjects	Percent
Normal Range (18.5-24.9)	10	19.2
Overweight (25.0-29.9)	19	36.5
Obese (≥ 30.0)	23	44.2

* Only 52 of the total 55 subjects recorded height and weight information for BMI calculation

Physical Activity Assessment Tool Findings

In the BRFSS questionnaire 43.6 percent of participants reported participating in no physical activity or exercise within the last 30 days. Among the 56.4 percent who did report physical activity within the last 30 days, half of the subjects (50.9%) reported participating in moderate activity for at least 10 minutes at a time for three or more days per week. Of those who reported any physical activity only 5.5 percent reported moderate activity for just one to two days per week, while 34.5 percent reported five or more days of moderate activity per week. Even lower were the response rates on vigorous physical activity within this population. Vigorous physical activity was less common as only one-third (33.3%) of the subjects reported three or more days of vigorous activity for at least 10 minutes at a time per week.

Table 4.3 highlights responses from the BRFSS and PAR data results as the data were compiled into the days per week of activity with the amount of time spent doing activity at each level. From these data, just over one third of the participants (38.9%) reported participated in at least three and a half hours per week of BRFSS moderate physical activity, and only 22.6 percent reported at least three and a half hours per week of BRFSS vigorous physical activity.

Table 4.3

Subjects Levels of Physical Activity (n=55)

Assessment Tool	Number of Subjects	Percent
BRFSS		
Any physical activity	31	56.4
Moderate physical activity*	21	38.9
Vigorous physical activity*	12	22.6
PAR		
Moderate physical activity*	38	69.1
Hard physical activity *	29	52.7
Very Hard physical activity*	18	32.7

*Physical activity level was set for at least 3.5 hours per week in accordance with US Surgeon General recommendations of at least 30 minutes per day of at least moderate physical activity

In PAR, almost 70 percent (69.1%) of subjects reported participation in moderate activities, greater than 50 percent (52.7%) in hard activities, and almost one third of subjects (32.7%) reported very hard activities for at least three and a half hours per week. These results are considerably different, as while almost 70 percent (69.1%) reported moderate activities according to the PAR assessment tool, only 38 percent (38.9%) reported what should be the same types of moderate activities using the BRFSS assessment tool. That trend continues when comparing more strenuous types of activities. Among the PAR hard activities 52 percent reported participating and 32 percent reported participating in PAR very hard activities, yet only 22 percent reported participation in BRFSS vigorous activities, which must compare to the PAR hard and very hard activities.

The relationship between BRFSS and PAR was further examined using Chi Square plus Fisher's Exact Chi Square test, when appropriate. From this data BRFSS and PAR moderate activity were compared as well as BRFSS vigorous activity to both PAR hard and very hard activity. A significant difference in proportions was found between BRFSS and PAR moderate

activity ($p=0.0312$). Between BRFSS vigorous and PAR hard there was no significant difference ($p=0.0904$) found suggesting that responses to the questions did not differ significantly. Lastly, there were no significant differences between BRFSS vigorous and PAR very hard ($p=0.1385$).

Other factors were found through stepwise regression to effect physical activity at each intensity level and for each assessment tool. While researchers initially hypothesized that factors including subject age, number of children, employment, body mass index, and education could be factors influencing physical activity, only a few factors were found to significantly impact perceived physical activity. For BRFSS, moderate physical activity was significantly impacted by number of children ($p=0.0008$). The amount of moderate activity the Latina mother engaged in decreased as the number of children increased. Similarly, for PAR moderate activity not only did the number of children significantly contribute ($p=0.0009$), but body mass index ($p=0.0176$) and employment ($p=0.0281$) as well. These results show that not only as the number of children increased did moderate activity decline but that the amount of time spent at work as well as an increased body mass index all negatively impacted moderate physical activity. While there were no factors that were found to significantly impact BRFSS vigorous physical activity, the PAR hard activity was significantly impacted by employment ($p=0.0127$) as well as by age ($p=0.0337$) and the PAR very hard was impacted by age ($p=0.0131$). These higher intensity results indicate that as age increased the levels of hard and very hard activities among the Latina mothers decreased.

Physical Activity Monitor Findings

Twenty-three of fifty-five subjects returned pedometer recalls, accounting for a 41 percent response. Actual physical activity was measured in this study by the Omron HJ-105 pedometer. Participants were asked to log steps daily and an average of their weekly steps was

used to determine their normal average daily steps. Subjects' daily steps were categorized based on the cut points proposed by Tudor-Locke and Bassett (74). Although currently no universal standards exist for categorizing daily steps, these cut points were used to differentiate subjects' daily actual physical activity levels. Tudor-Locke described less than 5,000 steps as sedentary, 5,000-7,499 as low active, 7,500-10,000 as somewhat active, and greater than or equal to 10,000 as active (74). For the purposes of this research less than 5,000 steps was considered sedentary and greater than 5,000 steps was considered moderately active. As few participants accumulated greater than 5,000 steps, those that did in fact average greater than 7,500 steps were viewed as simply greater than 5,000 steps or somewhat or moderately active.

Of the physical activity recalls returned, only 31 percent of the subjects reported an average of greater than 5,000 steps per day. As such, the sample size for analysis and power were too small to see significant differences among the different levels of physical activity that were assessed within the questionnaires. From the data collected, however, correlations could be seen between the number of steps taken and the BRFSS and PAR moderate physical activity. From the Chi Square results, the number of people who perceived themselves to be moderately active by the BRFSS standards and were considered moderately active with the pedometer results was only 25 percent. Similarly, for PAR the number of people who accurately recognized their own moderate activity level was only 30 percent. Seventy-five percent and seventy percent respectively, of subjects who averaged greater than 5,000 steps per day, did not perceive themselves to be at a moderately active BRFSS and PAR level.

CHAPTER V MANUSCRIPT DISCUSSION

Discussion

Physical activity assessment tools such as the Behavioral Risk Factor Surveillance System (BRFSS) continue to be used to track health risks in the United States among adults to guide statewide and national programming. The results presented in this study, however, question the accuracy of this tool in correctly assessing and estimating moderate physical activity when compared with the Seven-Day Physical Activity Recall (PAR). In making this comparison the PAR was used as the standard because it not only covers a greater breadth of physical activity, as it asks more questions that assess physical activity than the BRFSS, which only contain five physical activity questions, but the reliability of the PAR has been supported by significant test-retest correlations (75,76,77). Further, validity of the PAR in adult populations has been established through relationships between the PAR and other measures of physical activity, fitness, or energy expenditure, such as doubly labeled water (78,79), maximum oxygen consumption (75,80), motion sensors (75,81), and self-report measures of physical activity (80,82). The PAR has further been validated for the measurement of physical activity in ethnically diverse, low-income, WIC eligible, postpartum women (10). The PAR also contains a list of activities sheet that included job, home, and sports and recreation activities participants could use to identify the intensities of activities in which they participate.

The PAR may have overcome some confusion in interpretation that may have occurred in determining what the different intensity levels of physical activity were in BRFSS, because of the list of activities sheet. The PAR results for moderate activity were compiled for analysis to show an entire week, as there are separate questions for weekday and weekend activity. Subjects reported how many hours they participated in each type of activity. The response rate in PAR

for all levels of activity intensity in the number of subjects who were active was higher than BRFSS. These findings presented suggest the questions regarding moderate physical activity in the BRFSS cause subjects to record significantly less moderate activity ($p=0.0312$) when compared to PAR. This could be a result of the BRFSS wording, as most survey instruments to date are not sensitive to racial/ethnic differences, and the assessment tools are therefore likely to misrepresent the actual physical activity patterns of women from minority backgrounds (5,35). As Latinas are more likely to engage in light to moderate activities as part of their daily lives, it is the significant difference between the assessment tools of moderate activities that requires further inquiry.

Cultural attitudes also influence survey response. It is important to ensure that terms used in the assessment tools are relevant for the specific target population, Latinas, and that they are well defined, unambiguous, and not offensive to the participants (5). While there was no significant difference between BRFSS vigorous and either PAR hard or very hard physical activity, the lack of amount of strenuous activity within this population could account for the similarities in the findings between these levels of physical activity. Within BRFSS, less than one-third of subjects reported vigorous activity; demonstrating vigorous types of activities were not common within this population. Both PAR hard and PAR very hard activity were not found to be significantly different from BRFSS vigorous activity. Thus, it can be said that among higher intensity activities the two physical activity assessment tools similarly assess levels of physical activity. As Latinas are more likely to engage in moderately intense activities such as household and walking activities, and are less likely to be involved in structured exercise, such as jogging, exercise classes, biking, and swimming on a regular basis, it is not surprising they would report a low level of vigorous, hard, or very hard physical activity (5). Part of the reason

for the difficulty in assessing physical activity levels in women by questionnaire is that they tend to engage in activities such as child care and household activities that are hard to quantify (14). In fact, Dowda and colleagues (2003) suggested that individuals who perform household chores and childcare duties and held physically active jobs may have accumulated more moderate to vigorous physical activity each day than was reported (34).

The results here also show an inverse relationship between number of children and amount of both BRFSS ($p=0.0008$) and PAR ($p=0.0009$) moderate physical activity. PAR moderate physical activity was further negatively associated with BMI (0.0176) and employment on the part of the Latina mother (0.0281), supporting other studies findings. In Latina mothers, these results from PAR suggest that an increase in number of children, BMI, and hours of employment were all associated with a decrease in amount of moderate physical activity. These results agree with previous research that found that women who were employed or had large families were less active than unemployed or women with smaller families (34). Also, while other studies have reported that lack of education negatively impacts level of physical activity, even though greater than 85 percent of subjects in this study had at most a high school degree; no significance was found between education and physical activity on any intensity level or within either the BRFSS or PAR.

As BRFSS and PAR are based on memory recall, physical activity that is done as part of daily life and not as structured exercise is hard to remember. Perceived activity as is measured by these tools may not accurately reflect the actual amounts of physical activity in which Latinas engage. For Latinas who are active as part of their daily lives the pedometer was a more accurate measure to determine actual physical activity through a weekly average of steps taken.

Although no significance was found in the comparison of pedometer average steps per week participants took and moderate physical activity assessment by the BRFSS and PAR because of the small sample size of pedometer response, correlations could be made. Chi square results showed consistency in questionnaire response and step counts in those that considered themselves not active on the BRFSS and step counts averaging less than 5,000 steps per day which was the cut point for sedentary physical activity. Sixty-five percent of subjects who responded no physical activity on BRFSS also had step counts considered sedentary. The opposite, however, was not true. Subjects in general who were active at a level that promotes health were not aware of their amount of physical activity. For both BRFSS and PAR subjects whose step counts placed them as moderately active did not perceive themselves to be moderately active. Only 25 percent and 30 percent of subjects, on BRFSS and PAR respectively, accurately placed themselves as moderately active when in fact their step counts determined this association. This again shows that among Latina women, specifically mothers, the activities they may engage in such as household chores and childcare are hard to quantify and not considered physical activity among this population. These pedometer result comparisons suggest that the current physical activity assessment tools and measurement of actual physical activity through pedometers accurately assess physical activity in the sedentary or inactive population, but that there is some discrepancy in measurements of moderate physical activity within this population.

These results are consistent with previous research which reported that if minority women counted all the housework they do they would fulfill the national recommendations on physical activity, and that lifetime averages for total activity from all sources was highest among Latinas, and lowest among Anglo women (37,59). Latinas, in fact, were found to spend significantly more time with strenuous household chores than either African Americans or

Anglos (59). While the results show that Latina mothers are not partaking in adequate amounts of vigorous, hard, or very hard activities, there is some question as to the actual amounts of moderate activities in which they engage. As physical activity to promote health from the US Surgeon General states, individuals should accumulate at least 30 minutes of moderate intensity activity on a daily basis. This activity can be broken up into separate bouts throughout the day, thus the activities that women engage in related to care of the family and the home would count as activities towards health as long as were performed for at least 10 minutes at a time at a moderate intensity level (20,72).

The self-selected sample of Latina mothers that participated is the foremost limitation of this study. Other limitations include the small sample size; limited power of pedometer recalls; inability of pedometers to distinguish physical activity intensity; inability of pedometers to measure different types of physical activity (including swimming, weight lifting, and bicycling) other than walking; and the limited generalizability of results to Latina mothers that are not involved in the WIC program.

In conclusion, the BRFSS and PAR physical activity assessment tools elicit different responses in moderate physical activity among Latina mothers. While there were no significant differences among more intense physical activities specifically vigorous, hard, and very hard, the lack of activities at these levels could account for no difference seen. The PAR has been shown to be accurate with many populations including with low income ethnically diverse postpartum women and was therefore used as the comparison for BRFSS. As significant differences were seen between the two physical activity assessment tools in moderate physical activity, further research is needed to determine ways to more accurately assess moderate levels of physical activity within this population to help decrease health risks and encourage physical activity.

CHAPTER VI DISCUSSION AND CONCLUSIONS

Discussion

The BRFSS is the world's largest telephone survey and is used to track health risks in the United States. Information from the survey is used to improve the health of the American people. The survey includes questions about health risk behaviors, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury (9). In this study, the accuracy of this tool in assessing physical activity was compared with PAR. From the results presented there were significant differences between BRFSS and PAR in calculation of moderate physical activity. BRFSS is used to assess national health, and more research is needed to test the accuracy of this tool in eliciting accurate response with regard to physical activity in all minority populations as well as the general US population. Lack of question comprehension could lead to underreported activity and skewed results for minority populations. In this study, 43.6 percent of subjects reported no physical activity on the initial BRFSS physical activity question, while for PAR almost 70 percent (69.1%) reported at least 3.5 hours per week of physical activity of at least 30 minutes per day of at least moderate intensity level in accordance with US Surgeon General recommendations (20). This difference in response is further demonstrated as only 38.9 percent of subjects reported BRFSS moderate physical activity levels in accordance with US Surgeon General recommendations. The percentage of subjects who felt they engaged in moderate physical activity in PAR was almost double that of the BRFSS questionnaire.

As moderate activity is valuable in the promotion of health, the lack of more intense activities within this population is not the key issue. While BRFSS has been updated to cover more domains of physical activity including household, transportation, and leisure time it may

still not be asking the right types of questions to elicit accurate responses (25). Examples of activity given in BRFSS may not be culturally sensitive and subjects may respond better to more diverse examples. It is also important to acknowledge and include culturally diverse activities, such as dancing, participation in religious celebrations, and community involvement in a physical activity survey as a way to improve participation and interest of respondents (5). As walking is the most often reported type of physical activity, and most likely to be performed as part of the daily routine, it is important to note that brisk walking is the exertion level which is considered of moderate intensity for physical activity. Previous studies have found that among Latina subjects who did accomplish recommended levels of physical activity through their daily lives, they did not feel they obtained the same benefits from pure physical activity resulting from housework compared to leisure time physical activity when they went out for the sole purpose of exercising (37). As often Latinas feel the need to be "on call" 24 hours a day, and they typically structure their time around their families, work, and other responsibilities they do not often have time to exercise exclusively (5).

In this study 43.7 percent of subjects fit into the youngest age group category of 18 to 24 years of age. This is not unexpected, as younger women are more likely to need the assistance of a program like WIC. As previous research has shown that lack of education can negatively affect physical activity it was surprising that education did not have a significant effect on any level of physical activity. It is hypothesized that education is less of a factor in this population because subjects were already involved in WIC, and have had some nutrition and health education already from clinic staff. It is possible, that within these required nutrition education sessions, that physical activity and its importance have been acknowledged. Other factors that did not have a significant effect on physical activity among those who reported these factors

were breastfeeding and physical disability. Subjects who fit these factors did not differ in actual amount of physical activity based on pedometer results.

Possible ways to increase the accuracy of BRFSS in minority women is to include more diverse examples of activity. It also needs to be noted that subjects who accumulate physical activity through everyday activities may not recognize an increase in heart rate as they are not intentionally exercising. As PAR had a greater breadth of questions regarding physical activity, it took subjects more time to fill out, but its list of activities reference sheet was key for Latinas in understanding where activities they did fit as far as intensity. PAR did take more time as subjects had to flip back and forth to the list of activities page, but included diverse activities such as carrying children and doing laundry. These listed activities are more sensitive to this population as childcare and household chores are the main types of physical activity Latina women engage in, further illustrating the increased accuracy of PAR. As BRFSS will continue to be the world's largest survey to track health risks, it is important to find a way to incorporate diverse activity examples, and if possible some sort of activities reference list explaining what activities constitute a moderate and vigorous intensity level. Thus, a modified questionnaire that includes lists of activities such as the PAR could be used to develop a tool to more accurately assess physical activity in minority populations.

Conclusions

Based on the results presented in this study, moderate physical activity is the key to increasing and incorporating more physical activity in the lives of Latina mothers. Findings from this study show that standardization to what is moderate physical activity between questionnaires is necessary to accurately measure physical activity. Further standards are needed to determine levels of physical activity in physical activity pedometer monitors. While

preliminary cut points have been established by Tudor-Locke and colleagues more research is needed to validate these levels to encourage the use of pedometers to easily and accurately measure physical activity (72).

Suggestions for improving the study include: recruiting a larger sample size to increase the power of my results; and add an additional component to the study of several focus groups with participants, of eight to ten subjects to elicit their responses to the questionnaire. Through this process we would explore misconceptions as to question wording, confusion between BRFSS and PAR tools, and from the PAR list of activities reference sheet gather suggestions for other activities that should have been included. Focus groups would need to be offered various times to allow for Latina mothers who work or need childcare the opportunities to participate at times that were convenient to them to increase participation. A benefit to conducting focus groups would not only be the ability to gather subject opinions on physical activity, but also to give another opportunity to collect pedometer recalls. As return rate of pedometer recalls was low, at 41 percent, having the opportunity to meet again with subjects would allow face to face interaction where I could present them with their incentive for returning their 7 day physical activity pedometer recall.

It would also be possible with focus groups to provide health education materials about physical activity to subjects who were interested. As brochures were overwhelmingly the number one preference choice to receive physical activity information, and in fact several mothers asked when they would be receiving materials as part of the current study, providing information at a setting such as a focus group discussing physical activity is another way to increase awareness about physical activity and encourage subjects to incorporate physical activity into their daily lives. It is also important with this population of new mothers to

encourage physical activity that is family-oriented. Activities that can be done with both children and spouses alike are more likely to increase participation in physical activity, as Latinas are extremely family-oriented.

Also, from the focus groups there is the opportunity to elicit responses from subjects as to what types of physical activities were not included in questionnaires. From the PAR list of activities reference sheet and subject suggestions a future addition to the study would be to create a new physical activity assessment tool based on the PAR list of activities reference sheet and subject suggestions. This tool would be based less on literacy and more on visual cues such as pictures of different physically demanding activities to overcome issues with question wording and more accurately assess physical activity within these populations.

Future researchers within this population must recognize the limitations of the BRFSS in accurately assessing physical activity among Latina mothers. It is recommended that researchers use the PAR for more widespread physical activity assessment and that the validity of PAR on a large, even possible US scale be conducted to gather physical activity data. Researchers should also look into measuring height and weight data versus self-reported height and weight as was done in this research. By actually measuring heights and weights researchers can be certain that calculated BMI accurately reflect the study population. To more accurately assess actual physical activity future researchers should look into using accelerometers instead of pedometers. While pedometers were chosen in this study because of low cost and relative effectiveness, to increase accuracy of step count results researchers should consider the use of accelerometers. Future research should also demonstrate reversing assessment tool placement in the questionnaire where PAR questions are first and BRFSS questions follow to ensure that questionnaire order did not affect participant response. It is also important for researchers to

know that WIC has in place programs to encourage physical activity within their clientele, such as the FitWIC program. While not all clinics prescribe to this available tool, this already developed program is a possible avenue to encourage and incorporate physical activity among Latina mothers who are enrolled in WIC.

For health educators the results presented show that simply encouraging moderate physical activity at 10 minutes at a time several times throughout the day is a sensible way to encourage compliance to physical activity. Educators of minority and specifically Latina populations must recognize the need to incorporate physical activity into daily life, and find avenues to reach these clients. *Promotoras* or lay health educators are an excellent way to promote physical activity in Latinas. As a *promotora* is of a similar socio-cultural background to the population, that person is in a unique position to provide peer support and encourage physical activity (63). It is also essential to make education materials available in both English and Spanish. As two of the top three preferred education material responses from subjects in this study were written, newspaper articles and brochures, having follow up materials available in both English and Spanish continue to emphasize a healthy and active lifestyle.

For professionals in the health field it is necessary to recognize that Latinas may be less likely to belong to a gym or own exercise equipment because of the cost and cultural barriers, so activities that require few resources are best suited for this population. Health professionals must find ways to encourage the incorporation of activity into Latinas daily routines. Whether it is walking to the store, going to the park and playing with children, or activities around the house it is imperative that health professionals find avenues to encourage at least moderate intensity level physical activities, such as brisk walking. Professionals in the health field are in a unique position because they can not only educate and work with Latinas on the importance of being

physically active, but can monitor progress and provide support for physical activity and health. Health professionals should promote a more widespread adoption of the FitWIC principles and find ways to incorporate some FitWIC ideas into busy WIC clinics. Health professionals have the ability to not only educate clients, but also follow their progress through research and provide support to the adoption of a healthier lifestyle. From this study participants learned more about their own levels of physical activity and were surprised and encouraged to become more physically active. From comments recorded on physical activity recalls (such as the example listed below) subjects wanted to take more responsibility of their physical activity. With their ability to monitor physical activity through pedometers these Latina subjects have been given the tools to create a better health for their future.

“Thanks for the chance to participate, it’s nice to know what we do and don’t do.

And I now know I have to walk more.”

REFERENCES CITED

1. U.S. Census Bureau. Overview of Race and Hispanic Origin. 2000. <http://www.census.gov/prod/2001pubs/c2kbr01-1.pdf>. Accessed March 31, 2006.
2. U.S. Census Bureau. U.S. Interim Projections by Age, Race, and Hispanic Origin. 2004. <http://www.census.gov/ipc/www/usinterimproj/natprojtab01a.pdf>. Accessed on December 11, 2005.
3. Ramirez RR, de la Cruz GP. The Hispanic populations in United States: March 2002. Current Population Reports. <http://www.census.gov/prod/2003pubs/p20-545.pdf>. Accessed on December 11, 2005.
4. U.S. Census Bureau. American Community Survey. Data Profile Highlights. 2004. http://factfinder.census.gov/servlet/ACSSAFFacts?_event=&geo_id=01000US&_geoContext=01000US&_street=&_county=&_cityTown=&_state=&_zip=&_lang=en&_sse=on&_ActiveGeoDiv=&_useEV=&_pctxt=fph&_pgsl=010. Accessed March 31, 2006.
5. Tortolero SR, Masse LC, Fulton JE, Torres I, Kohl HW 3rd. Assessing physical activity among minority women: focus group results. *Womens Health Issues*. 1999;9(3):135-42.
6. Keller C, Trevino RP. Effects of two frequencies of walking on cardiovascular risk factor reduction in Mexican American women. *Res Nurs Health*. 2001;24(5):390-401.
7. Voorhees CC, Rohm Young D. Personal, social, and physical environmental correlates of physical activity levels in urban Latinas. *Am J Prev Med*. 2003;25(3 Suppl 1):61-8.
8. Wilbur J, Chandler PJ, Dancy B, Lee H. Correlates of physical activity in urban midwestern Latinas. *Am J Prev Med*. 2003;25(3 Suppl 1):69-76.
9. Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005. <http://www.cdc.gov/nccdphp/publications/aag/brfss.htm>. Accessed on August 9, 2005.
10. Wilkinson S, Huang C, Walker LO, Sterling BS, Kim M. Physical Activity in low-income postpartum women. *J Nurs Scholar*. 2004;36(2):109-14.
11. U.S. Census Bureau: State and County QuickFacts Virginia. 2000. <http://quickfacts.census.gov/qfd/states/51000.html>. Accessed December 11, 2005.
12. U.S. Census Bureau: State and County QuickFacts Texas. 2000. <http://quickfacts.census.gov/qfd/states/48/4817000.html>. Accessed December 11, 2005.

13. Physical Activity and Fitness U.S. Department of Health and Human Services Healthy People 2010 Progress Review. 2004. <http://www.healthypeople.gov/data/2010prog/focus22/> Accessed on December 11, 2005.
14. Kriska AM, Rexroad AR. The role of physical activity in minority populations. *Womens Health Issues* 1998;8(2):98-103.
15. Ransdell LB, Wells CL. Physical activity in urban white, African-American, and Mexican-American women. *Med Sci Sports Exerc.* 1998;30(11):1608-15.
16. Gordon-Larsen P, Harris KM, Ward DS, Popkin BM. Acculturation and overweight-related behaviors among Hispanic immigrants to the US: the National Longitudinal Study of Adolescent Health. *Soc Sci Med.* 2003;57(11):2023-34.
17. Goslar PW, Macera CA, Castellanos LG, Hussey JR, Sy FS, Sharpe PA. Blood pressure in Hispanic women: the role of diet, acculturation, and physical activity. *Ethn Dis.* 1997;7(2):106-
18. Collins R, Lee RE, Albright CL, King AC. Ready to be physically active? The effects of a course preparing low-income multiethnic women to be more physically active. *Health Educ Behav.* 2004;3(1):47-64.
19. Juarbe TC. Cardiovascular disease-related diet and exercise experiences of immigrant Mexican women. *West J of Nurs Rsch.* 1998:765-75.
20. Physical Activity and Health: A Report of the Surgeon General. Atlanta, Ga: National Center for Chronic Disease Prevention and Health Promotion; 1996. <http://www.cdc.gov/nccdphp/sgr/women.htm>. Accessed on December 12, 2005.
21. Gilliland FD, Li Y, Baumgartner K, Crumley D, Samet JM. Physical activity and breast cancer risk in Hispanic and Non-Hispanic white women. *Am J Epidemiol.* 2001;154(5):442-50.
22. Wood FG. Leisure time activity of Mexican Americans with diabetes. *J of Adv Nurs.* 2004;45(2):190.
23. Gordon-Larsen P, Adair LS, Popkin BM. Ethnic differences in physical activity and inactivity patterns and overweight status. *Obes Res.* 2002;10(3):141-9.
24. Rainwater DL, Mitchell BD, Comuzzie AG, VandeBerg JL, Stern MP, MacCluer JW. Association among 5-year changes in weight, physical activity, and cardiovascular disease risk factors in Mexican Americans. *Am J Epidemiol.* 2000;152(10):974-82.
25. Centers for Disease Control and Prevention (CDC). Morbidity and Mortality Weekly Report. Prevalence of Physical Activity, Including Lifestyle Activities Among Adults-United States, 2000-2001. August 15, 2003 issue. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5232a2.htm>. Accessed August 9, 2005.

26. Macera CA, Ham SA, Yore MM, Jones DA, Ainsworth BE, Kimsey CD, Kohl HW 3rd. Prevalence of Physical Activity in the United States: Behavioral Risk Factor Surveillance System, 2001. *Prev Chronic Dis.* 2005;2(2):A17.
http://www.cdc.gov/pcd/issues/2005/apr/04_0114.htm. Accessed May 3, 2005.
27. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Prevalence Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005.
http://apps.nccd.cdc.gov/brfss/race_c.asp?cat=EX&qkey=4347&yr=2004&state=TX&bkey=20044804&qtype=C&yr_c=2000&state_c=&bkey_c=333511&qtype_c=C&grouping=&resp=1. Accessed December 11, 2005.
28. National Institutes of Health (NIH). Behavior Change Consortium.
<http://www1.od.nih.gov/behaviorchange/measure/7dayPAR.htm>. Accessed December 11, 2005.
29. Blair SN, Haskell WL, Ho P, Paffenbarger Jr. RS, Vranizan KM, Farquhar JW, Wood PD. Assessment of habitual physical activity by a seven-day recall in a community survey and controlled experiments. *Am J Epidemiol.* 1985;122(5):794-804.
30. Washburn RA, Jacobsen DJ, Sonko BJ, Hill JO, Donnelly JE. The validity of the Stanford seven-day physical activity recall in young adults. *Med Sci Sports Exerc.* 2003;35(8):1374-80.
31. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey Data. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005.
<http://www.cdc.gov/nchs/about/major/nhanes/hlthprofess.htm>. Accessed December 12, 2005.
32. Crespo CJ, Smit E, Carter-Pokras O, Andersen R. Acculturation and leisure-time physical inactivity in Mexican American adults: results from NHANES III, 1988-1994. *Am J Public Health.* 2001;91(8):1254-7.
33. Crespo CJ, Smit E, Andersen RE, Carter-Pokras O, Ainsworth BE. Race/ethnicity, social class and their relation to physical inactivity during leisure time: results from the Third National Health and Nutrition Examination Survey, 1988-1994. *Am J Prev Med.* 2000;18(1):46-53.
34. Dowda M, Ainsworth BE, Addy CL, Saunders R, Riner W. Correlates of physical activity among U.S. young adults, 18 to 30 years of age, from NHANES III. *Ann Behav Med.* 2003;26(1):15-23.
35. Bull FC, Eyler AA, King AC, Brownson RC. Stage of readiness to exercise in ethnically diverse women: a U.S. survey. *Med Sci Sports Exerc.* 2000;33(7):1147-56.
36. Amesty SC. Barriers to physical activity in the Hispanic community. *J Pub Health Policy.* 2003;24(1):41-58.

37. Eyler AA, Baker E, Cromer L, King AC, Brownson RC, Donatelle RJ. Physical activity and minority women: a qualitative study. *Health Educ Behav.* 1998;25(5):640-52.
38. Juniu, S. The impact of immigration: Leisure experience in the lives of South American immigrants. *J of Leisure Rsch.* 2000;32(3):358-81.
39. Laffrey SC. Physical activity among older Mexican American women. *Res Nurs Health.* 2000;23(5):383-92.
40. Gettleman L, Winkleby M. Using focus groups to develop a heart disease prevention program for ethnically diverse, low-income women. *J Comm Health.* 2000;25(6):439-53.
41. Berg JA, Cromwell SL, Arnett M. Physical activity: perspectives of Mexican American and Anglo American midlife women. *Health Care Women Int.* 2002;23(8):894-904.
42. Shea S, Basch CE, Wechsler H, Lantigua R. The Washington Heights-Inwood healthy heart program: a 6-year report from a disadvantaged urban setting. *Am J Public Health.* 1996;86(2):166-71.
43. Warnecke RB, Johnson TP, Chavez N, Sudman S, O'Rourke DP, Lacey L, Horm J. Improving question wording in surveys of culturally diverse populations. *Ann Epidemiol.* 1997;7(5):334-42.
44. Juarbe T, Turok XP, Perez-Stable EJ. Perceived benefits and barriers to physical activity among older Latina women. *West J Nurs Res.* 2002;24(8):868-86.
45. Sundquist J, Winkleby M. Country of birth, acculturation status and abdominal obesity in a national sample of Mexican-American women and men. *Int J Epidemiol.* 2000;29(3):470-7.
46. Cousins JH, Rubovits DS, Dunn JK, Reeves RS, Ramirez AG, Foreyt JP. Family versus individually oriented intervention for weight loss in Mexican American women. *Public Health Reports.* 1992;107(5):549-56.
47. Evenson KR, Sarmiento OL, Ayala GX. Acculturation and physical activity among North Carolina Latina immigrants. *Soc Sci Med.* 2004;59(12):2509-22.
48. Evenson KR, Sarmiento OL, Tawney KW, Macon ML, Ammerman AS. Personal, social, and environmental correlates of physical activity in North Carolina Latina immigrants. *Am J Prev Med.* 2003;25(3 Suppl 1):77-85.
49. Eyler AA, Matson-Koffman D, Vest JR, Evenson KR, Sanderson B, Thompson JL, Wilbur J, Wilcox S, Young DR. Environmental, policy, and cultural factors related to physical activity in a diverse sample of women: The Women's Cardiovascular Health Network Project--summary and discussion. *Women Health.* 2002;36(2):123-34.

50. Evenson KR, Sarmiento OL, Macon ML, Tawney KW, Ammerman AS. Environmental, policy, and cultural factors related to physical activity among Latina immigrants. *Women Health*. 2002;36(2):43-57.
51. Eyler AA, Matson-Koffman D, Young DR, Wilcox S, Wilbur J, Thompson JL, Sanderson B, Evenson KR. Quantitative study of correlates of physical activity in women from diverse racial/ethnic groups: The Women's Cardiovascular Health Network Project--summary and conclusions. *Am J Prev Med*. 2003;25(3 Suppl 1):93-103.
52. U.S. Department of Health and Human Services. *Healthy People 2010: Objectives for improving health*. Washington D.C.: U.S. Public Health Service, 2000.
<http://www.healthypeople.gov/document/tableofcontents.htm#parta>. Accessed December 12, 2005.
53. Sallis JF, Greenlee L, McKenzie TL, Broyles SL, Zive MM, Berry CC, Brennan J, Nader PR. Changes and tracking of physical activity across seven years in Mexican-American and European-American mothers. *Women Health*. 2001;34(4):1-14.
54. Sanchez-Johnsen LA, Fitzgibbon ML, Martinovich Z, Stolley MR, Dyer AR, Van Horn L. Ethnic differences in correlates of obesity between Latin-American and Black women. *Obes Res*. 2004;12(4):652-60.
55. Heesch KC, Masse LC. Lack of time for physical activity: perception or reality for African American and Hispanic women? *Women Health*. 2004;39(3):45-62.
56. Mouton CP, Calmbach WL, Dhanda R, Espino DV, Hazuda H. Barriers and benefits to leisure-time physical activity among older Mexican Americans. *Arch Fam Med* . 2000;9:892-7.
57. Melillo KD, Williamson E, Houde SC, Futrell M, Read CY, Campasano M. Perceptions of older Latino adults regarding physical fitness, physical activity, and exercise. *J Geron Nurs*. 2001;9:38-46.
58. Afghani A, Abbott AV, Wiswell RA, Jaque SV, Gleckner C, Schroeder ET, Johnson CA. Central adiposity, aerobic fitness, and blood pressure in premenopausal Hispanic women. *Int J Sports Med*. 2004;25(8):599-606.
59. Fulton-Kehoe D, Hamman RF, Baxter J, Marshall J. A case-control study of physical activity and non-insulin dependent diabetes mellitus (NIDDM). The San Luis Valley Diabetes Study. *Ann Epidemiol*. 2001;11(5):320-7.
60. Kieffer EC, Willis SK, Arellano N, Guzman R. Perspectives of pregnant and postpartum Latino women on diabetes, physical activity, and health. *Health Educ Behav*. 2002;29(5):542-56.

61. Regensteiner JG, Shetterly SM, Mayer EJ, Eckel RH, Haskell WL, Baxter J, Hamman RF. Relationship between habitual physical activity and insulin area among individuals with impaired glucose tolerance. The San Luis Valley Diabetes Study. *Diabetes Care*. 1995;18(4):490-7.
62. John EM, Horn-Ross PL, Koo J. Lifetime physical activity and breast cancer risk in a multiethnic population: the San Francisco Bay area breast cancer study. *Cancer Epidemiol Biomarkers Prev*. 2003;12(11 Pt 1):1143-52.
63. Kim S, Koniak-Griffin D, Flaskerud JH, Guarnero PA. The impact of lay health advisors on cardiovascular health promotion: using a community-based participatory approach. *J Cardiovasc Nurs*. 2004;19(3):192-9.
64. Escobar-Chaves SL, Tortolero SR, Masse L, Watson KB, Fulton JE. Recruiting and retaining minority women: findings from the women on the move study. *Ethn and Dis*. 2002;12:242-51.
65. Simpson ME, Serdula M, Galuska DA, Gillespie C, Donehoo R, Macera C, Mack K. Walking trends among U.S. adults: the behavioral risk factor surveillance system, 1987-2000. *Am J Prev Med*. 2003;25(2):95-100.
66. Brown WJ, Miller YD, Miller R. Sitting time and work patterns as indicators of overweight and obesity in Australian adults. *Int J Obs*. 2003;27:1340-6.
67. Hultquist CH, Albright C, Thompson D. Comparison of walking recommendations in previously inactive women. *Med Sci Sports Exerc*. 2005;37(4):676-83.
68. Schneider PL, Crouter SE, Bassett DR. Pedometer measures of free-living physical activity: comparison of 13 models. *Med Sci Sports Exerc*. 2004;36(2):331-5.
69. Rooney B, Smalley K, Larson J, Havens S. Is knowing enough? Increasing physical activity by wearing a pedometer. *Wisc Med J*. 2003;102(4):31-6.
70. Tudor-Locke C, Burkett L, Reis JP, Ainsworth BE, Macera CA, Wilson DK. How many days of pedometer monitoring predict weekly physical activity in adults? *Prev Med*. 2005;40:293-8.
71. Bassett DR, Cureton AL, Ainsworth BE. Measurement of daily walking distance-questionnaire versus pedometer. *Med Sci Sports Exerc*. 2000;32(50):1018-23.
72. Ainsworth BE. Issues in assessment of physical activity in women. *Res Quart Exerc Sport*. 2000;71(2):37-42.
73. Centers for Disease Control and Prevention (CDC). Body Mass Index: BMI for Adults: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2006. <http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-adult.htm>. Accessed March 1, 2006.

74. Tudor-Locke C, Bassett DR Jr. How many steps/day are enough? preliminary pedometer indices for public health. *Sports Med.* 2004;34(1):1-8.
75. Jacobs DR Jr., Ainsworth BE, Hartman TJ, Leon AS. A simultaneous evaluation of 10 commonly used physical activity questionnaires. *Med Sci Sports Exerc.* 1993;25:81-91.
76. Richardson MT, Ainsworth BE, Jacobs DR Jr., Leon AS. Validation of the Stanford 7-day recall to assess habitual physical activity. *Ann Epidemiol.* 2001;11:145-53.
77. Williams E, Klesges RC, Hanson CL, Eck LH. A prospective study of the reliability and convergent validity of three physical activity measures in a field research trial. *J Clin Epidemiol.* 1989;42:1161-70.
78. Conway JM, Seale JL, Jacobs DR Jr., Irwin ML, Ainsworth BE. Comparison of energy expenditure estimates from doubly labeled water, a physical activity questionnaire, and physical activity records. *Am J Clin Nutr.* 2002;75:519-25.
79. Leenders NYJM, Sherman WM, Nagaraja HN, Kien CL. Evaluation of methods to assess physical activity in free-living conditions. *Med Sci Sports Exerc.* 2001;33:1233-40.
80. Dishman RK, Steinhardt M.. Reliability and concurrent validity for a 7-d recall of physical activity in college students. *Med Sci Sports Exerc.* 1988;20:14-25.
81. Welk GJ, Thompson RW, Galper DI. A temporal validation of scoring algorithms for the 7-day physical activity recall. *Measure Phys Ed Exerc Sci.* 2001;5(3):123-38.
82. Blair SN, Haskell WL, Ho P, Paffenbarger RS Jr., Vranizan KM, Farquhar, JW. Assessment of habitual physical activity by a seven-day recall in a community survey and controlled experiments. *Am J Epidemiol.* 1985;122:794-804.

APPENDIX

Institutional Review Board

Dr. David M. Moore
IRB (Human Subjects) Chair
Assistant Vice President for Research Compliance
CVM Phase II- Duckpond Dr., Blacksburg, VA 24061-0442
Office: 540/231-4991; FAX: 540/231-6033
email: moored@vt.edu

DATE: April 14, 2005

MEMORANDUM

TO: Elena L. Serrano Human Nutrition, Foods, & Exercise 0430
Kelleigh Murphy

FROM: David Moore 

SUBJECT: **IRB Expedited Approval:** "Measuring Physical Activity with Latina and non-Latina Mothers" IRB # 05-293

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective April 14, 2005.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/20/07) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File

Department Reviewer: Kathy Hosig

WIC CLINIC APPROVAL

August 3, 2005

I hereby consent that Kelleigh Murphy has obtained permission to collect data for her research study about the physical activity habits of Latina mothers at the Horne Road WIC clinic in Corpus Christi, Texas.


CONFIDENTIAL

Signature

Celina L. Hernandez

Print

Virginia Polytechnic Institute & State University Research Study

Physical Activity Questionnaire

Virginia Tech is currently conducting a study in your community related to measuring physical activity among mothers. If you meet all of the following criteria, we invite you to complete the questionnaire:

- Female between the ages of 18 and 50
- Latina
- Have at least one child under 5 years old living at home
- Are *not* currently pregnant

The questionnaire contains 39 questions about your health and physical activity practices and should take approximately twenty minutes to complete. The results will help improve assessments of physical activity of mothers and evaluate the reliability and validity of current physical activity questionnaires. Your participation is completely voluntary and all of your answers will be kept confidential. If you complete the entire questionnaire and return the enclosed postcard, you will receive a \$20 gift card to Walmart and a free pedometer worth \$15.

For more information on this study please contact:

Dr. Elena Serrano
(540) 231-3464

Kelleigh Murphy
(540) 231-2488

Thank you.



VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

The goal of this survey is to understand physical activity habits of mothers living in Corpus Christi. We will be asking you similar types of questions about physical activity from different questionnaires. Even if a question seems similar PLEASE answer it. Your answers will be used to improve future physical activity questionnaires. Please fill in the best answer for each question.

Behavior Risk Factor Surveillance System

1. During the **past 30 days**, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?

- Yes Don't know / Not sure
 No

If answer is "no" - skip to Question 4.

We are interested in two types of physical activity, vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate while moderate activities cause small increases in breathing or heart rate.

2. Now thinking about the moderate physical activities you do (when you are not working) in a usual week, do you do moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, doing laundry, gardening, or anything else that causes small increases in breathing or heart rate?

2a. How many days per week do you do these moderate activities for at least 10 minutes at a time? _____

2b. On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities? _____

3. Now thinking about the vigorous physical activities you do (when you are not working) in a usual week, do you do vigorous activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?

3a. How many days per week do you do these vigorous activities for at least 10 minutes at a time? _____

3b. On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities? _____

Seven-Day Physical Activity Recall

This next section is called the Seven-Day Physical Activity Recall. The information from this section will be used to estimate the number of calories you burn up through physical activity. Please refer to the List of Activities on the last page (page 7) of the questionnaire to differentiate between light, moderate, hard, or very hard activities including all three types of activities: job, home, and sport or recreation. Note that hard and very hard are explained differently than vigorous in the last section.

4. On the average, how many hours did you sleep each night during the last five weekday nights, **Sunday through Thursday**?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

5. On the average, how many hours did you sleep each night **last Friday and Saturday nights**?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

6. How many hours did you spend during the **last five weekdays** doing these moderate activities or others like them? (Include time at your job, home, and doing sports or recreation)

_____ hours per day ★ 0 if not applicable

_____ minutes per day

7. How many hours did you spend **last Saturday and Sunday** doing these moderate activities?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

8. How many hours did you spend during the **last five weekdays** doing these hard activities or others like them?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

9. How many hours did you spend **last Saturday and Sunday** doing these hard activities?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

10. How many hours did you spend the **last five weekdays** doing these very hard activities, or others like them?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

11. How many hours did you spend **last Saturday and Sunday** doing these very hard activities?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

12. Were you employed outside the home during the **last seven days**? If no, put zeros for questions 12-16. If yes, how many days?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

13. How many hours per day?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

14. How many of these hours per day were spent doing moderate activities?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

15. How many of these hours per day were spent doing hard activities?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

16. How many of these hours per day were spent doing very hard activities?

_____ hours per day ★ 0 if not applicable

_____ minutes per day

17. Compared to your physical activity over the past three months, was last week's physical activity more, less, or about the same?

- More
- Less
- About the same

18. In order to develop quality educational programs, please place a check mark by your top 3 choices on how you would like to receive health promotion and physical activity information. (Please do not check more than 3)

- | | |
|--|--|
| <input type="checkbox"/> Group class in your community (or school) | <input type="checkbox"/> Brochures |
| <input type="checkbox"/> Newspaper articles | <input type="checkbox"/> Radio programs |
| <input type="checkbox"/> Group class at a Health Extension office | <input type="checkbox"/> Home visit |
| <input type="checkbox"/> Television programs | <input type="checkbox"/> Internet |
| <input type="checkbox"/> Group class at your worksite | <input type="checkbox"/> Newsletters |
| <input type="checkbox"/> Video or cassette tapes | <input type="checkbox"/> Seminars, conferences |
| <input type="checkbox"/> Community bulletin boards | <input type="checkbox"/> Health fairs |
| <input type="checkbox"/> Other - Please write in: _____ | |
-

We really appreciate you taking the time to participate in this. Please check to make sure that you have answered **all** of the questions that apply to you. All questions must be filled out to receive a gift certificate. For completing this questionnaire and the 7 day physical activity recall with the pedometer you will be mailed a \$20 gift card to Walmart.

Name and Address for Receiving Gift Card

Thank you again!!

SEVEN-DAY PHYSICAL ACTIVITY RECALL

List of Activities

Type of Activity	Job	Home	Sport or Recreation
Light	Typing Standing Driving	Ironing, Sewing Light auto repair Indoor painting	Leisurely walking Softball Bowling Playing a musical instrument
Moderate	Lifting or carrying light objects (up to 5 lbs. or 2.27kg) Painting outside the house	Sweeping, mopping, vacuuming Clipping hedge Raking Mowing lawn with power mower Cleaning windows Pushing stroller with child	Brisk walking (on level ground) Shooting baskets Throwing frisbee Cycling leisurely on level ground Swimming laps (easy laps) Weightlifting
Hard	Construction work Lifting or carrying (objects 5-15 lbs. or 2.27-6.82kg) Climbing ladder or stairs	Scrubbing floors Shoveling dirt, coal, etc. Mowing lawn with a non-power mower Carrying child (5-15 lbs. or 2.27-6.82kg)	Brisk walking (uphill) Backpacking on level ground Brisk cycling on level ground without losing breath Tennis (doubles) Downhill skiing Swimming laps (moderate effort)
Very Hard	Carrying heavy loads Such as bricks or lumber Carrying moderate loads Up stairs (16-40 lbs or 7.27-18.18kg)	Digging ditches Chopping or splitting wood Gardening with heavy tools	Jogging Basketball (in game) Soccer (in game) Backpacking (uphill) Cycling (uphill or racing) Tennis (Singles) Cross country skiing Swimming laps (hard effort) Aerobic dancing Circuit training (using a series of Nautilus machines without stopping running a par-course)

Virginia Polytechnic Institute & State University

Investigación

Cuestionario sobre Actividades Físicas

Virginia Tech actualmente conduce un estudio en su comunidad que tiene como objetivo medir la actividad física entre las madres. Por ello, si usted reúne los siguientes requisitos le invitamos a que llene el cuestionario.

- Es mujer de entre 18 y 50 años.
- Latina
- Tiene por lo menos un niño/a de menos de 5 años viviendo con usted.
- No esta embarazada

El cuestionario consiste en 39 preguntas acerca de su salud y la actividad física que practica, y lo podrá llenar en veinte minutos más o menos. Este cuestionario es importante porque los resultados ayudarán a incrementar el conocimiento sobre la actividad física de las madres y a evaluar que tan confiables y válidos son los cuestionarios que actualmente se usan sobre actividades físicas. Su participación es completamente voluntaria y sus respuestas serán absolutamente confidenciales. Si usted llena el cuestionario y lo devuelve en un sobre sellado, usted recibirá una tarjeta de regalo para la tienda Wal-mart equivalente a \$20 y un podómetro (medidor de pasos) que tiene un valor de \$15.

Si tiene dudas o necesita más información sobre el estudio, por favor contacte a:

Dra. Elena Serrano
540-231-3464

Kelleigh Murphy
540-231-2488

Muchas gracias por su participación.



VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

Antes de llenar la sección sobre actividad física, necesitamos preguntar alguna información personal. El propósito de esta sección es conocer mejor a la población que estamos midiendo. Por favor llene con la respuesta apropiada las siguientes preguntas.

<p>A. ¿Cuántos años tiene? _____ años</p>	<p>B. Su situación matrimonial. Marque la categoría con la que se identifica. ___ Soltera (nunca se ha casado, divorciado, separado o es viuda) ___ Casada</p>	<p>C. ¿Cuál es el ingreso total de su casa?: (Por favor marque solo una casilla)</p> <p>___ \$10,000 ___ \$10,000-19,999 ___ \$20,000-34,999 ___ \$35,000-49,999 ___ \$50,000+ ___ No sé.</p>
<p>D. ¿Dónde nació? _____ ciudad _____ país</p>	<p>E. ¿Cuánto tiempo ha vivido en los Estados Unidos? _____ años _____ meses _____ Nací en los Estados Unidos</p>	
<p>F. Educación terminada (Marque una)</p> <p>___ No tengo un diploma de la escuela media superior, preparatoria o secundaria o un diploma GED ___ Tengo un diploma de preparatoria o de la escuela media superior o un diploma equivalente. ___ Tengo una carrera técnica de dos años. ___ Tengo educación mayor a la escuela preparatoria, pero NO TENGO un título universitario. ___ Tengo por lo menos cuatro años de Universidad o más (Licenciatura, Maestría o Doctorado)</p>		<p>G. ¿Cuántos años tienen sus hijos? ¿Viven con usted en la casa? Si lo hacen, por favor marque "sí".</p> <p>_____ años _____ Si _____ años _____ Si _____ años _____ Si _____ años _____ Si</p>
<p>I. ¿De qué raza se considera usted? ___ Blanca _____ Negra _____ Asiático/De las Islas Pacíficas ___ Indio Americano/Alaska Es usted Latinoamericana/Hispana? Si _____ No _____ Otra _____</p>		<p>H. ¿Tiene algún tipo de impedimento físico que no le permita participar en actividades físicas? Si _____ No _____</p>
<p>J. Empleo: (Por favor marque uno)</p> <p>___ No tengo ningún tipo de empleo. ___ Tengo un trabajo temporal fuera de la casa (menos de 35 horas a la semana) ___ Tengo un trabajo de tiempo completo fuera de la casa. (35 horas a la semana o más) ___ Tengo un negocio que manejo desde la casa. (Por ejemplo, cuidar otros niños además de los míos) (Por favor descríballo incluyendo cuántas horas trabaja) _____</p>		<p>K. ¿Está dándole pecho a alguno de sus hijos en este momento? Si _____ No _____</p>
<p>M. ¿Cuál es su peso y estatura?</p> <p>_____ Peso en kilogramos O _____ Peso en libras _____ Estatura en centímetros Altura _____ pies _____ pulgadas</p>		<p>L. Tiene acceso en la casa a los siguientes servicios (por favor marque todas las posibilidades)</p> <p>___ a computadora ___ ninguna ___ Internet</p>
<p>O. Cuando le preguntan sobre su peso usted siente que:</p> <p>___ Está baja de peso ___ Está en el peso correcto ___ Tiene sobre peso</p>		<p>N. En general como considera que está su salud</p> <p>___ Excelente ___ Bien ___ Más o menos ___ Pobre ___ No lo sé/No estoy segura</p>

El propósito de esta encuesta es entender como es la actividad física de las madres que viven en el estado de Virginia. Le vamos a hacer algunas preguntas similares sobre su actividad física de diferentes tipos de cuestionarios. Por ello le pedimos que POR FAVOR conteste todas las preguntas aunque estas se parezcan mucho. Sus respuestas nos servirán también para mejorar otros cuestionarios sobre actividades físicas. Por favor complete con la mejor respuesta para cada pregunta.

Sistema De Vigilancia Del Factor De Riesgo Del Comportamiento

1. ¿Hizo usted alguna actividad física o ejercicio, diferente a su trabajo, como salir a correr, hacer calistenia, jugar al golf, trabajar en el jardín o caminar para ejercitarse, en **los últimos 30 días?**

- Sí No sé / No estoy segura
 No

Si la respuesta es no pase a la Pregunta 4.

Estamos interesados en dos tipos de actividad física, vigorosa y moderada. Una actividad física vigorosa es aquella que causa un gran incremento en la respiración y las pulsaciones del corazón, mientras que una actividad moderada causa un pequeño incremento en la respiración y las pulsaciones del corazón.

2. Ahora, pensando en las actividades físicas moderadas que usted hace en una semana normal (cuando no está trabajando), hace usted alguna actividad moderada por lo menos 10 minutos como: caminar rápidamente, hacer bicicleta, aspirar, lavar la ropa, cuidar el jardín, o cualquier otra cosa que cause un pequeño incremento en su respiración o ritmo del corazón.

2a. ¿Cuántos días a la semana hace usted actividades moderadas por un mínimo de 10 minutos? _____

2b. En los días que hace actividades moderadas por lo menos 10 minutos, ¿cuánto tiempo en total al día pasa haciendo estas actividades? _____

3. Ahora, pensando en las actividades físicas vigorosas que hace en una semana normal (cuando no está trabajando), hace usted alguna actividad vigorosa por lo menos 10 minutos, como correr, hacer ejercicios aeróbicos, trabajar mucho en el jardín, o algo más que cause un incremento considerable al respirar o en su ritmo cardiaco.

3a. ¿Cuántos días a la semana hace usted estas actividades vigorosas por lo menos durante 10 minutos? _____

3b. En los días que usted hace actividades vigorosas por lo menos 10 minutos, ¿cuánto tiempo en total por día pasa haciendo estas actividades?

Recuento de las Actividades Físicas por Siete Días

La siguiente sección se llama Recuento de las Actividades Físicas por Siete Días. La información de esta sección será usada para estimar el número de calorías que usted quema a través de la actividad física. Por favor refiérase a la Lista de Actividades en la última página (página 7) del cuestionario para diferenciar entre actividades ligeras, moderadas, pesadas o muy pesadas, incluyendo todo tipo de actividades, en el trabajo, en la casa y de recreación o deportes. Por favor, tenga en cuenta que las actividades pesadas y muy pesadas se explican de diferente manera que el término vigoroso de la sección anterior.

4. En promedio, ¿cuántas horas durmió usted cada noche durante los pasados días entre semana, de **Domingo a Jueves**?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

5. En promedio, ¿cuántas horas durmió las noches del **Viernes y Sábado pasados**?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

6. ¿Cuántas horas pasó durante **los últimos cinco días de entre semana** haciendo estas actividades moderadas u otras como estas? (Incluya tiempo en su trabajo, su casa, haciendo ejercicio o en alguna actividad recreativa)

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

7. ¿Cuántas horas pasó **el último Sábado y Domingo** haciendo estas actividades moderadas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por hora

8. ¿Cuántas horas pasó durante **los últimos cinco días de entre semana** haciendo estas actividades pesadas u otras como esas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

9. ¿Cuántas horas pasó usted **el último Sábado y Domingo** haciendo estas actividades pesadas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

10. ¿Cuántas horas pasó usted **los últimos cinco días de la semana** haciendo estas actividades muy pesadas, u otras como esas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

11. ¿Cuántas horas pasó usted **el último Sábado y Domingo** haciendo estas actividades muy pesadas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

12. Trabajo usted fuera de su casa durante **los últimos siete días**? Si no, ponga ceros en las preguntas 12 a 16. Si contesta que si, ¿cuántos días trabajo?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

13. ¿Cuántas horas por día?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

14. ¿Cuántas de estas horas por día pasó haciendo actividades moderadas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

15. ¿Cuántas de estas horas por día pasó usted haciendo actividades pesadas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

16. ¿Cuántas de estas horas por día pasó haciendo actividades muy pesadas?

_____ horas por día ★ 0 si no se aplica

_____ minutos por día

17. ¿Comparado con sus actividades físicas en los últimos tres meses, la actividad física de la semana pasada fue mayor, menor, o más o menos igual?

- Más
- Menos
- Más o menos igual

18. Para mejorar la calidad de los programas de educación, por favor marque 3 de las opciones sobre como le gustaría recibir información sobre la salud o sobre las actividades físicas. (Por favor no marque más de 3 respuestas)

- | | |
|---|--|
| <input type="checkbox"/> Clases grupales en su comunidad (o escuela) | <input type="checkbox"/> Folletos |
| <input type="checkbox"/> Artículos en los periódicos | <input type="checkbox"/> Programas de radio |
| <input type="checkbox"/> Clases grupales en alguna oficina de Extensión de la Salud | <input type="checkbox"/> Visitas a casas |
| <input type="checkbox"/> Programas de televisión | <input type="checkbox"/> Internet |
| <input type="checkbox"/> Clases grupales en su trabajo | <input type="checkbox"/> Boletines informativos |
| <input type="checkbox"/> Videos o cintas para escuchar | <input type="checkbox"/> Seminarios y conferencias |
| <input type="checkbox"/> Boletines informativos comunitarios | <input type="checkbox"/> Ferias de la salud |
| <input type="checkbox"/> Otra - por favor escriba su sugerencia: _____ | |
-

Realmente apreciamos su tiempo. Por favor, asegúrese de que conteste **todas** las preguntas que se relacionan con usted. Todas las preguntas deben ser llenadas para poder recibir la tarjeta de regalo. Por haber llenado el cuestionario y el recuento de las actividades físicas por 7 días se le enviara la tarjeta de regalo por \$20 de la tienda Walmart y un podómetro (contador de pasos) con un valor de \$15. Por favor escriba sus datos.

Nombre y Dirección

Muchas Gracias de Nuevo!!!

RECUESTO DE LAS ACTIVIDADES FISICAS POR 7 DIAS

Lista de Actividades

Tipo de actividad	Trabajo	Casa	Deportiva o recreativa
Ligeras	Escribir a máquina Estar de pie	Planchar o coser Auto reparaciones del auto ligeras	Caminata ligera Softball Boliche
	Manejar	Pintar interiores	Tocar un instrumento musical
Moderadas	Levantar o cargar cosas ligeras Objetos (más de 5 libras o 2.27 kilos)	Barrer y trapear Aspirar	Caminar energéticamente (en un lugar plano) Practicar tirando en la canasta de basketball.
	Pintar fuera de la casa	Cortar los arbustos Limpiar las hojas con un rastrillo Cortar el césped con una podadora eléctrica. Limpiar las ventanas Empujar la carreta con el niño.	Tirar un frisbee Montar en bicicleta (en un lugar plano) Nadar en periodos cortos (sin mucho esfuerzo) Levantar pesas
Pesadas	Trabajar en la construcción Levantar o cargar objetos (de 5-15 libras o de 2.27 a 6.82 Kg.)	Trapear el suelo Apalea tierra, carbón, etc.	Caminar rápidamente en una cuesta Cargar una mochila de campamento a nivel del suelo.
	Subir escaleras.	Cortar el césped con una máquina no eléctrica. Cargar a un bebé (De 5 a 15 libras o de 2.27 a 6.8 Kg.)	Montar en bicicleta a nivel del suelo sin perder el aliento. Jugar al tenis (dobles) Esquiar cuesta abajo Nadar en periodos medianos (esfuerzo moderado)
Muy Pesadas	Cargar o levantar objetos pesados. Como ladrillo o madera de construcción.	Cavar zanjas Cortar madera	Correr Jugar un juego de básquetbol o Jugar fútbol (en equipo)
	Cargar objetos pesados por las escaleras (16-40 lb. o 7.27-18.18kg)	Cultivar un huerto o jardín con herramientas pesadas.	Escalar Andar en bicicleta cuesta arriba o en competencia Jugar tenis (singles) Esquiar a campo traviesa Nadar por periodos prolongados (con mucho esfuerzo) Hacer aeróbicos Entrenar para un circuito (usando la serie de maquinas Nautilus sin parar) Correr/ Correr en una pista

Seven-Day Walking Recall using Pedometers

Instructions: Before you go to bed each night please fill in the number of steps you walked for that day. You can start on any day (such as Tuesday). For 7 days fill in your information. Once you have finished your 7 days, please fold this sheet, put the attached sticker on the edges to hold it closed, and drop it in the mail to return to us. Once we receive your recall your gift card will be sent to you.
Thank you!

Week of:

	Steps walked	Comments or Feelings on that day
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		
Total		

Instructions: Please fill in your work schedule for each day of the week. If you did not work, place a 0 in that box.

	WORK SCHEDULE (example 9am - 5pm)
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Thank you for your time!

**Contando el tiempo de caminata usando el Podómetro (el contador de pasos)
por siete días.**

Instrucciones: Antes de irse a la cama por favor llene el número de pasos que usted dio ese día. Usted puede empezar cualquier día (por ejemplo un martes). Por favor, ponga la información durante 7 días. Una vez que termine con sus 7 días doble la hoja, ponga los sellos que están en las orillas para cerrarla, póngala en el buzón y la información llegara a nosotros. Una vez que tengamos la hoja le enviaremos su tarjeta de regalo.
!Muchas gracias!

Semana, fecha:

	Pasos dados	Comentarios sobre ese día.
Lunes		
Martes		
Miércoles		
Jueves		
Viernes		
Sábado		
Domingo		
Total		

Instrucciones: Por favor llene las siguientes casillas con el horario de trabajo por cada día de la semana, si no trabajó por favor ponga 0 en ese lugar.

	Horario de trabajo (por ejemplo de 9am - 5pm)
Lunes	
Martes	
Miércoles	
Jueves	
Viernes	
Sábado	
Domingo	

!Gracias por su tiempo!

Dear Participant,

We would like to thank you for your involvement in our project concerning physical activity habits in Latina mothers that was conducted over the summer at the WIC clinic on Horne Road. We greatly appreciate you taking the time to fill out the questionnaire regarding your physical activity habits. We would like to encourage you to wear your pedometer for 7 days (1 week) and record the number of steps you take each day on the postcard (pedometer recall) we have enclosed and return it to us. Please write down how many hours you work each day too at the bottom of the postcard. Once we receive your pedometer recall with your 7 days of steps we will send you a \$20 gift card for Wal-mart.

Again thank you for your prior participation in this project. It will help us better understand physical activity habits in Latina mothers. We also hope that you will continue to use the pedometer in the future. We greatly appreciate your time.

Sincerely,

Kelleigh Murphy and Dr. Elena Serrano