EXPLORING HEALTH GEOGRAPHY BY EXAMINING PHYSICAL ACTIVITY IN OLDER LATINO WOMEN LIVING IN RURAL AND URBAN COMMUNITIES

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THESIS

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ABSTRACT

Latinos are increasingly found outside of places where they have traditionally resided. Rural Midwestern communities where new Latino immigrants are settling have experienced accelerated growth in their overall population and their Latino populations. Urban communities are also experiencing an increase in the number of Latino individuals. Latinos are being drawn to cities for economic and personal reasons. As the United States prepares for an increase in both Latinos and older adults, understanding their health behaviors, like physical activity, in different geographic settings will be of utmost importance. It is known that many Latino individuals are predisposed to obesity, type II diabetes and cardiovascular disease, all of which may be prevented with regular physical activity (Caballero, 2005). Physical activity is one modifiable health behavior that is linked with better health and a higher quality of life.

The purpose of this study is to better understand levels of physical activity among older Latino women in two geographically different areas (urban and rural) and the impact of the community perceptions in geographic areas. Demographic information, levels of physical activity using accelerometers, survey data on community perceptions were gathered. This information was obtained from a sample of older Latino women living in the city of Chicago, Illinois (urban) (n=28) and a sample near Cobden, Illinois (rural) (n=14). Results from accelerometery data show an overall low level of moderate-intensity PA participation among this population, with significant difference ($p=0.06$) between rural (31.86 ± 36.5 min/wk) and urban (101.13 ± 131.9 min/week) subjects. Also, older Latino women living in the rural site were significantly ($p=0.04$) less likely to meet the 2008 National recommendation guidelines for physical activity (150 min/wk of moderate-intensity PA) than their urban counterparts (rural 100% were considered inactive, whereas 74% from the urban site). This study takes a step

towards better understanding underserved populations in an effort to create effective public health and community based interventions towards physical activity.

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Know that wisdom is like honey for you:

If you find it, there is a future for you,

And your hope will not be cut off.

Proverbs 24:14

Thanks to all of those that have helped me find the honey.

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CHAPTER 1

INTRODUCTION

1.1 The Importance of Physical Activity in Older, Latino Women

As the United States prepares for an increase in both Latinos and older adults, understanding their health behaviors in different geographic settings will be of utmost importance. The increase in older adults will place greater financial strain on a system that is already too expensive. Physical activity can better the health status of individuals and make them less likely to develop chronic disease. The cost of controlling chronic disease is extremely high so it is of utmost importance to stop or delay the onset of these diseases in America's aging population. However, the problem is that are currently few specific interventions programs available to increase or promote levels of physical activity in older adults. Current recommendations like those from the Center for Disease Control and Prevention don't always work for unique groups of people, like minorities living in rural or inner city urban areas.

As the population of older adults in varying geographic areas continues to rise, it is essential that these communities be well understood and have appropriate interventions created.

Understanding variations in physical activity patterns is important for planning health interventions (Swenson, Marshall, Gilbertson, Baxter, & Morgenstern, 2005). Physical activity is influenced by policies, practices in education, transportation, parks and recreation, media, and business. Thus multiple sectors of society must be involved in the solutions and acknowledge that here is no single solution to increasing physical activity. By doing this, the public health community can improve the quality of life of older adults, improve their overall health status, and sub sequentially save the health care system money and time by slowing their decline and aging process.

1.2 Research Objectives

It has been shown previously that older adults in rural areas have lower levels of physical activity than their urban counterparts. However, the research is out of date. Policy makers, public health officials, and the medical community need more recent data to understand the current trends. Once the study has been completed, the data will be compared and analyzed to understand the physical activity behaviors in both rural and urban areas.

The purpose of this pilot study is to better understand levels of physical activity among older Latino women in two sub-groups of the population and the impact of the community and geographic area. Using this baseline data, researchers can further the investigation and focus their efforts. Another purpose of this study is to increase our understanding of the factors that contribute to physical activity decisions among older Latina women. We plan to gather information regarding the levels, perceptions, and attitudes towards physical activity. This information can lay the foundation for larger studies and be useful in tailoring meaningful physical activity interventions for this population. Specifically, the objectives are as follows:

1) To analyze accelerometer data to determine levels of physical activity in subject population and to compare two geographic locations;
2) To collect survey data regarding demographics to better understand the subject population;
3) To conduct survey regarding subject's perception of their community and their physical activity.

CHAPTER 2

LITERATURE REVIEW

2.1 Importance of Physical Activity

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. The many advantages of physical activity include promoting health and well-being, delaying or preventing the onset of chronic disease and disability, and reducing mortality. According to the 2008 Physical Activity Guidelines for Americans published by the U.S. Department of Health and Human Services, in order to obtain health benefits, adults should engage in at least 150 minutes a week of moderate-intensity physical activity. Despite the known benefits of physical activity, participation rates are low. Physical inactivity is the fourth leading cause of death due to non-communicable disease worldwide. The most recent estimates indicate that sixty percent of the world's populations are exposed to health risks due to physical inactivity. (Global Advocacy for Physical Activity, 2011). Physical inactivity is related directly and indirectly to leading risk factors for non-communicable diseases such as high blood pressure, high cholesterol, and high glucose levels. In addition, physical activity has comprehensive benefits across the lifespan. It promotes healthy growth and development in children and young adults, prevents mid-life weight gain, and improves and maintains the quality of life and independence in older adults (GAPA, 2011). Substantial health benefits appear to occur when going from a completely sedentary lifestyle to introducing modest amounts of physical activity (Brownson et al., 2000).

In older adults, the importance of physical activity is magnified. The ability to maintain an independent, productive live is a sign of successful aging (Swenson et al., 2005). Older adults, both male and female, can benefit from regular physical activity. The American College

of Sports Medicine and the American Heart Association recommend levels of physical activity for older adults that are similar to the recommendations for younger adults, but there are several important differences. The recommended intensity of aerobic activity takes into account the older adult's aerobic fitness, activities for flexibility and balance activities for older adults that are at risk for falls. The promotion of physical activity in older adults should emphasize moderate-intensity aerobic activity, muscle strengthening, reducing sedentary behavior, and risk management (U.S. Department of Health and Human Services, 2010).

Physical activity is a modifiable risk factor related to the maintenance of health and function in older people (Heckler, 1985). The loss of strength and stamina attributed to aging is in part caused by reduced physical activity. Several studies have reported that physical activity declines with age (Swenson et al., 2005). By age seventy five, about one in three men and one in two women engage in no physical activity (Center for Disease Control, 2007). Additionally, it is known that a decline in independence is associated with higher rates of hospitalization and mortality (Berke, Koepsell, Moudon, Hoskins, & Larson, 2007).

Positive outcomes for older adults include more than physical independence. These outcomes also include the ability for the older adult to function and remain active the setting of their personal choice (Russ & Speck, 2009). Empowering older adults with the ability to stay in a setting of their choice longer leads to higher qualities of life. Physical activity reduces the risk of subsequent depression in older adults (Strawbridge, Deleger, Roberts, & Kaplan, 2008). Being active can also improve an older adult's functional status. A study investigating individuals 70-74 years of age from the Supplement on Aging Cohort found that participants who did not participate in regular exercise were more likely to suffer a decline in functional status over a 2 year period (Mor, Murphy, & Allen, 1989).

It is known that physical activity is major contributor to health status and various studies have tried to determine where the most physical activity occurs. The Behavioral Risk Factor Surveillance (BRFFS) data on leisure time physical activity in 49 states indicated that physical inactivity was higher in rural than metropolitan areas. Work related physical activity was not measured and thus, physical activity may have been underestimated in rural areas CDC Self Report 1996 (CDC, 2007). Wilcox and colleagues reported that rural middle-aged and older women were less active than urban women, except in the Western United States and among Hispanics, where activity in rural and urban women did not differ significantly. Ethnic and racial minorities have reported lower levels of recreational activity than non-Hispanic whites, however two studies indicated similar levels in Hispanics and non-Hispanic whites (Wilcox, Castro, King, Housemann, & Brownson, 2000). Thus, there is a great deal of uncertainty about physical activity patterns in older Hispanic and non-Hispanic older adults. Understanding the decline in physical activity can help health professionals plan and implement interventions to increase levels of physical activity in this vulnerable population.

2.2 Older Adults in the United States

People in the United States can anticipate living beyond seventy. The overall elderly population of the United States will increase rapidly over the next forty years. Older adults are the fastest growing sector of the United States population. In 2004, twelve percent of all Americans were sixty five and over. By 2050, people 65 and over will comprise an impressive twenty one percent of the U.S. population, indicated in special report published by the U.S. Census Bureau (Gist & Hetzel, 2004).

As Americans live longer, health professionals disagree whether these individuals will be able to enjoy long and healthy lives or experience chronic illness and disability (Russ & Speck, 2009). The desire for optimal health as Americans age positions physical activity to be an important part of wellness. Physical wellness in older adults recognizes the need for physical activity. Various organizations and settings have been designed to facilitate wellness in older adults' lives. However, there is much variance between people in the amount of support they are willing to take from others or in the amount of resources that are available to them. Senior centers were designed to help provide a buffer for some of the social, economic, and physical losses experienced by older adults. Senior centers play an important role in communities and serve as mechanisms for providing social and health services, an important gateway to understanding physical activity behaviors and levels in older adults (Russ & Speck, 2009)

2.3 Latinos in the United States

According to special report on the U.S. Census 2000 the total Hispanic or Latino population in the United States was 281,421,906 which is approximately 12.5% of the total US population (Grieco & Cassidy, 2001). The Latino population is predicted to be the nation's fastest growing minority group whose population will likely triple by the year 2050 (Passel & Cohn, 2008).

Latinos are increasingly found outside of places where they have traditionally resided. Rural Midwestern communities where new Latinos immigrants are settling have experienced accelerated growth in their overall population and their Latino populations. As of 2000, one of third of all rural counties in the 12 state Midwest Census Region had more than 300 Latino residents (Passel & Cohn, 2008). Over 3.2 million Latinos live in rural areas, encompassing over

6% of the nonmetropolitan population, and studies demonstrate that Latinos may comprise a rapidly growing portion of rural areas.

The nation's Latino population is diverse with persons from Latin America, the Caribbean, and Spain. Three fourths of all Latinos in nonmetro areas are Mexican. Particularly, in Illinois over 50,000 Latinos live in rural areas (Saenz, 2008).

The Latino population faces social and economic challenges associated with low levels of education and high rates of poverty. About 55% have a high school diploma while only 7% have a bachelor's degree. This is also a population that typically has high levels of employment in jobs that offer little or no health insurance (Saenz, 2008). High rates of uninsurance, along with language and cultural barriers to care, have contributed to the difficulties of meeting the needs of the Latino population.

The growth in Latino populations represents more than traditional migrant workers who have decided to relocate. The new immigrants are long-stay residents who are moving to work in light industry, meat packing, poultry, and other processing plants (Casey, Blewett, & Call, 1994). The health status of immigrant Latinos varies depending on a variety of factors including country of origin, occupation, living conditions, and lifestyle. Overall, Latino adults have a higher prevalence of diabetes, hypertension, and obesity then non-Latinos in the US (Casey et al., 1994). In addition to these problems, Latinos living in rural areas and inner city areas also must face the systematic problems that are found in these geographic areas regarding health care including: lack of resources with respect to physical activity engagement and education (Passel & Cohn, 2008).

Even though Hispanics are the fastest growing subgroup of older adults in the United States, there is little information on age related physical activity levels in this population.

Among Hispanic adults over age sixty five, it is estimated that only 34% engage in physical activity at the nationally recommended guidelines (CDC, 2007). Previous research has consistently suggested that physical activity participation is lower among older women (Weiss, O'Loughlin, Platt, & Paradis, 2007). Older women from minority backgrounds are among the least likely to meet the federal physical activity guidelines (Mouton, Calmbach, Dhanda, Espino, & Hazuda, 2000). Some studies suggest that older Latino/a adults are particularly vulnerable for physical inactivity, unhealthy lifestyle behaviors and the resultant chronic diseases and conditions (Caballero, 2005). Recent research suggests that Latina women may conceptualize physical activity differently from non-Hispanic White women and may therefore be less responsive to public health messages around the topic of physical activity (Gordon, 2005). This finding is consistent with research data that suggest that Latino seniors are less likely to be aware of national recommendations with respect to physical activity participation (Bennett, Wolin, Puleo, Masse, & Atienza, 2009).

2.4 Cultural and Health Geography

Cultural geography is the study of the many cultural aspects found throughout the world and how they relate to the spaces and places where they originate and then travel as people continually move across the various areas medical geographers have begun to focus not only on the distributive features of disease and disease services, but also on more complex notions of "place" (Kearns & Moon, 2002). In this context, places are conceptualized not just as sites where "observations" are located, but as more complex cultural and symbolic phenomenon constructed through relationships between people and their settings. Geographers have become interested in how places impact on and construct experiences of medicine, and how medicine impacts upon experience of places. Places may vary in form and scale from hospitals to community settings.

Both health and disease have geographical characteristics that are important in understanding their multifaceted nature. Furthermore, in terms of both its utilization and experience, health-care consumption is impacted by geographical factors such as location, distance, and social setting. Using both qualitative and quantitative research methods, health geographers have developed useful measures and concepts that may be useful to clinical and health services researchers (Andrews & Moon, 2005).

In the context of spatial health inequalities, considerable debate focuses on whether health and illness are more greatly influenced by the characteristics of people who reside in particular locales (composition), or by factors reflecting the wider nature of the environments within which people live (context) (MacIntyre, Ellaway, & Cummins, 2002). Compositional factors include gender, socio-economic status, severity or types of conditions, family capacity for care giving, personal economic resources, and debt load. Contextual effects on health include the quality of the built environment and collective relative or absolute income. Contextual factors highlight the significance of place in health disparities since place-based "opportunity structures" may promote or inhibit the health and health practices (Duncan, Jones, & Moon, 1993). Understanding contextual and compositional factors for a group of people can influence the success or failure of creating and maintaining a healthy community.

2.5 Understanding Rural and Urban Settings

According to the U.S. Census Bureau, rural is defined as anything outside of urbanized areas or urban clusters. Thus to understand rural classifications, urban classifications must first be defined. Urban areas and urban clusters consist of core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile. The lack of a more

appropriate definition can make researching rural areas difficult. However, this lack of an adequate definition should not be attributed to an unimportant group of society. Rural Americans make up 20% of the U.S. population and to some people this might seem like an insignificant amount of people (U.S. Census Bureau, 2001). The truth is that rural America has more people than the population of the United Kingdom, Spain, Italy, or France. It has more people than the combined populations of Canada, Australia, and New Zealand (Ricketts, 1999).

Rural America is home to proportionately fewer minority adults than Urban America. Five of every six rural adults are white versus seven of every ten urban residents (Patterson, Moore, Probst, & Shinogle, 2004). Rural adults have less formal education, are poorer, and are more likely to report having fair or poor health status than their urban peers (Ricketts, 1999). Approximately 20% of the United States population resides in rural areas. Previous studies have shown that larger proportions of rural adults were physically inactive than their urban peers. (Patterson et al., 2004).

The strengths of rural areas, social ties, shared experience and high quality of life are suggested as ways to address public health, infrastructure, and economic needs that are unique to rural areas. However, these social ties might be what stops some residents from seeking appropriate health services and encourage positive health behaviors like engaging in physical activity. A unique feature of rural populations is a proud and independent character (Stamm, Lambert, Piland, & Speck, 2007). While the American quality may be positive for some people, for other people it can result in negative health outcomes because an individual may seek care less often than is needed.

Numbers of adults are higher in rural areas and will increase as the baby boomer generation ages. Decreasing numbers of young adults are predicted to remain in rural areas

indicating the need for older adults to remain active and healthy. Research suggests that rural communities are not prepared to meet the upcoming challenges associated with the aging of the population (Russ & Speck, 2009). The majority of people in most rural areas are white, non-Hispanic. However, certain rural areas are seeing influxes of racial minorities which might make the results less generalizable to certain areas. Few rural specific interventions programs are available to increase or promote levels of physical activity in older adults.

The demographic characteristics of who is living in a city or urban setting at a particular time vary. Historical trends, fertility, in-migration (movement within national boundaries) and immigration (movement across national boundaries) all influence population composition (Vlahov et al., 2007).

Features of the urban environment can both harm and promote health in urban settings. Place of residence and an individual's status within the place are important determinants of health in urban settings (Ompad, Galea, Waleska, & Vlahov, 2007). While cities have some of the best healthcare facilities and attract high concentrations of medical professionals, these services are not equally distributed to inner- city areas and many poor urban residents lack access to them. The relevant features of the urban physical environment include access to safe drinking water, sanitation, drainage, garbage collection, and air and noise pollution.

Construction activity in cities can have an impact on pollution. The need for inexpensive housing is usually filled by less desirable physical environments and housing that other demographics might find unsuitable. Poor inner-city urban residents often live in overcrowded and inadequate housing, resulting in decreased quality of life and higher rates of respiratory disease, substance abuse, stress, violence, and death from heart disease and cancer. Natural and manmade disasters have also affected the health in urban neighborhoods (lower Manhattan after

9/11, New Orleans after Hurricane Katrina). Lack of urban resource infrastructure and tenuous relationships with governments and law enforcement also impacts health outcomes in a negative manner. Poor transportation inhibits access to employment and health services; access to safe and quality food can also be an issue (Vlahov et al., 2007). Immigrants living in ethnic enclaves within cities may have different experiences than immigrants living in areas in which they are the minority or there is no majority (Lafferty & Grady, 2005).

The social environment describes the structure and characteristics of relationships among people within a community. Components of the social environment include social networks, social capital, and the social support of interpersonal interactions (Vlahov et al., 2007). The social environment influences health through a variety of pathways, including the support of an individual, buffering or enhancing the impact of stressors, providing access to goods and services that influence health. The social environment of an urban area can support or damage health. Positive factors include higher levels of social support and the presence of organizations that can contribute to a higher quality of life and improved health outcomes. Negative features of the urban environment include support for health damaging behaviors such as drugs and gangs and high levels of social stressors such as social isolation, violence, and extreme poverty. The concentration of poverty can lead to social exclusion and reduce the access to health and social services (Vlahov et al., 2007).

There is substantial variability within urban and rural areas. Within a city, there can be wide variation between sociodemographic characteristics of residents that affect health outcomes (Ompad et al., 2007). Urban-rural comparisons remain limited in their ability to identify what those factors may be and the pathway through which they affect the health of the residents. Previous studies have shown conflicting data about the relative burden of disease in urban and

non-urban areas. While rural and urban America have unique geographic and quality-of-life characteristics, a recent report found that people who live in the most rural (areas with fewer than 10000 people) and inner-city areas have several things in common: they are more likely to live in poverty, experience higher mortality rates, and have poorer health status than suburban residents (Blumethal & Kagen, 2002).

Urban vs. rural studies usually contrast urban areas with rural areas in the same country. These studies seek to determine whether the relationships between a specific health condition and determinants of health that may be more or less prevalent in urban or rural areas (Ompad et al., 2007). Urban-rural comparisons remain limited in their ability to identify what factors influence the health behavior decisions, including the decision to be physically active or not. Features in urban and rural areas change over time and some factors may change due to population migration. Unsurprisingly, previous urban-rural comparisons have provided conflicting evidence about the relative health in urban and rural areas (Ompad et al., 2007).

2.6 Summary

The evidence is clear that physical activity is an important determinant of health. It is also clear that the older and Latino segments of the United States population will grow rapidly in the near future. By understanding these populations at the present, we can prepare the public health system to support these individuals in a way that will lead to continued health and the best quality of life possible. The literature reviewed consistently points to the problems within urban and rural older minority populations meeting physical activity guidelines. However, the common theme that emerges from this is that very few have offered evidence based interventions to actually improve the health behaviors such as physical activity. We hope that this study can

begin to understand the differences between geographic communities and how interventions can be constructed to influence physical activity levels and health behaviors.

CHAPTER 3

METHODOLOGY

3.1 Theoretical Framework: Social Ecological Model

The social ecological framework (Glanz, Rimer, & Viswanath, 2008) is a well suited approach to analyze physical activity levels in rural areas and urban areas due to the fact that variety of factors may contribute to differences (Judd, Cooper, Fraser, & Davis, 2006). The main concept of the social ecological model is that behavior has multiple levels of influence, including intrapersonal, interpersonal, organizational, community, physical environment, and policy (Glanz et al., 2008). Thus it is well suited to address differences in place because differences in place are not simply differences in location. Differences in place also result in differences in attitudes, beliefs, socio-economic status and an array of other conditions. Another important argument for using the social ecological model is that models like this can enhance human dignity by moving past explanations that hold individuals responsible for harmful behaviors (Glanz et al., 2008). Over the past decade, there has been renewed interest in the role of place in shaping people's health experience (Judd et al., 2006).

3.2 Research Plan

The research plans for the rural and urban locations are extremely similar. The differences are the recruitment agencies utilized and the age requirement for the location. For the rural location, the age requirement will be lowered to sixty or older to allow for a larger pool of women to be eligible and thus a high participation rate despite the lower overall population in this area. In the urban area, the age requirement will be sixty five or older.

All research materials and guidelines were approved by the University of Illinois Institutional Review Board and were provided in both the English and Spanish languages to

accommodate for linguistic preferences. All participants signed a consent form approved by the Review Board upon voluntary enrollment in the study, after which orientation took place to familiarize each participant with the study goals and provide basic instructions for their participation. Participants first engaged in ethics and instructional training (in English and/or Spanish) regarding use of accelerometers.

Participants in rural sample of this study included immigrant women of Mexican origin who are over the age of sixty. They were recruited from Cobden and Carbondale, a rural area located in southwest Illinois. These communities are unique with respect to their growing Latino populations and the resources available. “Jesus es el Senor,” a church dedicated to providing services in Spanish offered their collaboration towards this project. Leaders working at this church, a pastor, nurse practitioner and a community leader assisted the research team and helped with the recruitment of participants.

Participants in the urban sample in this study included immigrant women of Mexican origin who are over the age of 65. Most participants, representing both physically active and inactive lifestyles, were from low-income families with little education. They were recruited from Little Village, South Lawndale, Chicago, Illinois that is known for their large Mexican population. We established networking links with community agencies (Cook County Area Agency on Aging, Little Village Community Council, and the Saint Agnes Church) that each had extensive experience working with Hispanic seniors in the Chicago area and agreed to assist us in recruiting participants who both self-identified as Mexican and were females over the age of sixty five.

For the urban site, twenty eight participants were recruited for the study that involved the use of accelerometers to measure physical activity levels and a survey questionnaire that was

administered by trained members of the research team. For the rural site, fourteen participants were recruited. In order to accurately obtain physical activity information, participants were asked to wear an accelerometer for seven consecutive days. Accelerometers have been used successfully in older adult populations to provide valid and reliable estimates of physical activity levels (Harris et al., 2009). This procedure allowed us to divide the participants into groups that were either physically active or inactive based on actual physical activity data. Previous studies have shown discrepancies among Latino/a adults with respect to the different dimensions of physical activity (Marquez, Bustamante, McAuley, & Roberts, 2008). Thus, a survey questionnaire was also used to identify characteristics of the target population including: participant's body mass index, self-reported physical activity levels, socioeconomic status, and other demographic information. For this questionnaire, questions about the participant's perception of their neighborhood and neighbors were also included. This questionnaire will be coded and analyzed using SPPS to identify any relationships between sites.

Upon completion, the accelerometers were retrieved by the research team for data analyses. These steps were completed for both sites.

3.3 Data Analysis

Quantitative data was analyzed using SPSS 17.0. Demographic data was analyzed to better understand the lifestyle of the participants and questionnaire data regarding neighbors and neighborhood feelings were also coded and analyzed to better understand similarities and differences between the two geographic locations. Accelerometer data was calculated to determine levels of vigorous physical activity during the seven day period and to determine sedentary time during the study period.

CHAPTER 4

RESULTS

4.1 Discussion of Data

The urban sample of women completing the survey was larger than the rural sample (n=28, n=14, urban and rural samples respectively). This was expected due the differences in overall population. The data from the demographic survey is shown in Figure 1. From the demographic portion of the survey, a difference in age was found (69.1 ± 9.5, 74.1 ± 6.9, p=0.05). The country of birth was also statistically significant (p=0.046) between the rural and urban participants born in Mexico (11 (78.5), 21 (75.0) versus the United States (0 (0), 6 (21.4)). The years living in the U.S. was also found to be statistically significant (p=0.002) with rural (20.64 ± 16.8) and urban (41.86 ± 20.42). Levels of physical activity for participants might be affected by certain demographic characteristics. While the difference was not statistically significant, there appears to be a trend of more urban (20 (71.4)) than rural (4 (40)) participants having any kind of health insurance. It can be inferred that participants with health insurance are more likely to see a healthcare provider more often and potentially be informed of the benefits of being physically active. Exploring the link between health insurance and increased positive health behaviors, such as physical activity, could be a direction for the future.

Accelerometer data was collected from 37 older women of Mexican background (N=14 and 23, from rural and urban settings respectively) living in Illinois. Results from accelerometery data show an overall low level of moderate-intensity PA participation among this population, with difference (p=0.06) between rural (31.86 ± 36.5 min/wk) and urban (101.13 ± 131.9 min/week) subjects. Also, women living in the rural site were significantly (p=0.04) less likely

to meet the 2008 Department of Health and Human Services Physical Activity recommendation guidelines (150 min/wk of moderate-intensity PA) than their urban counterparts (rural 100% were considered inactive, whereas 74% from the urban site). The geographic difference in physical environment may help to explain some of the differences seen between rural and urban levels of physical activity. The physical environment of residents has previously been proposed as a deterrent for physical activity including: lack of indoor facilities, programs/age appropriate classes, transportation, and availability of senior centers, uneven surfaces, and travel distance. Safer sidewalks and roads make it more likely that individuals will use a form of active travel to get to their destination because of this an older person's activity level may be influenced by the built environment (Berke et al. , 2007).

Rural participants (1919.6 ± 1038.2) performed more minutes of light intensity activity per week than the urban participants (1561.4 ± 766.1). It is interesting to see the light intensity activity variation; however the moderate to vigorous intensity level of physical activity is most useful in comparing this population to others. There were differences between when the rural and urban women were more physically active and more sedentary. Weekend and week day activity could be related to the opportunities for leisure time activity. Opportunities for physical activity vary greatly between the rural and urban setting. For example, in urban areas there are more opportunities for organized activity and social gatherings that could encourage individuals to be active.

The rural participants of the study reported more favorably towards their neighbors and neighborhood than the urban participants on all items except one. It is known that the social environment of an urban area can support or damage health. Negative features of the urban

environment include levels of social stressors such as social isolation and exclusion. (Vlahov et al., 2007). This aspect of the survey appears to be highlighting those negative feelings for some participants. The concentration of poverty can lead to social exclusion and reduce the access to health and social services. Also, in urban settings it has been suggested that changes in the economic structure and decline in traditional activity may cause weakening of social ties and a loss of sense of community (Singh & Siahpush, 2002).

Additionally, other researchers have reported greater sense of belonging in rural areas which is supported by that data we collected. Addressing strengths that many rural areas commonly have can decrease stress and increase social ties. Shared life experiences are important in rural communities (Phillips & McLeroy, 2004). The strengths of rural areas, social ties, and shared experience are suggested as ways to address public health needs that are unique to rural areas (Stamm et al., 2007). Addressing the needs of physical activity of older Latino women in rural areas requires building upon the positive aspects of rural life while recognizing the differences in public resources, infrastructure, and economic needs of residents in rural areas. However, this survey data warrants more research because the rural participants reported more positively about their neighborhood, but had significantly lower levels of physical activity. This is an interesting relationship and it could be assumed that for some individuals their feeling towards their neighbors and neighborhoods does not directly affect their levels of physical activity. It might be possible that it affects the level of physical activity in ways that cannot be measured quantitatively but instead qualitatively research is needed.

Our study finds a wide variation between older Latina women living in rural and urban settings with respect to how physical activity is perceived and performed and the feelings toward their respective neighborhoods. Unsurprisingly, previous urban-rural comparisons have provided

conflicting evidence about the relative health in urban and rural areas (Ompad et al., 2007). Our findings suggest that if we are to successfully improve the health and well-being of not only older Latino women, but all older adults living in the United States, more qualitative research needs to be done in the area of physical activity.

4.2 Tables

Table 1: Demographics of Latino Women in Rural and Urban Community Sample

	Rural (N = 14)	Urban (N = 28)	P Value	x^2
Age, yrs	69.1 ± 9.5	74.1 ± 6.9	0.05	
Years in USA, yrs	20.64 ± 16.8	41.86 ± 20.42	0.002	
Mother of Children	6.07 ± 3.8	4.5 ± 3.0	NS	
# of Adults in Household	2.0 ± 1.2	1.7 ± 1.0	NS	
# of Children in Household	.78 ± 1.3	.14 ± .59	0.048	
County of Birth				
Mexico	11 (78.5)	21 (75.0)	0.046	6.1
United States	0 (0)	6 (21.4)		
Other Country	3 (21.4)	1 (3.6)		
Religion				
Catholic	6 (42.9)	26 (92.9)	NS	12.8
Other	8 (57.1)	2 (7.1)		
Marital Status				
Married	6 (42.9)	8 (28.6)	0.09	6.4
Divorced	4 (28.6)	3 (10.7)		
Widowed	2 (14.3)	15 (53.6)		
Never Married	2 (14.3)	2 (7.1)		
Has Health Insurance	4 (40)	20 (71.4)	0.077	3.1
Household Income for 2009				
$ 0-416	7 (53.8)	8 (32.0)	0.76	2.6
$ 417-833	3 (23.1)	7 (28.0)		
$ 834-1249	1 (7.7)	4 (16.0)		
$ 1250-1666	1 (7.7)	2 (8.0)		
$ 1667-2499	0 (0)	0 (0)		
$ 2500-3333	1 (7.7)	2 (8.0)		
$ 3334-4166	0 (0)	2 (8.0)		
$ 4167 & over	0 (0)	0 (0)		
Difficulty Paying Bills				
A great deal	7 (50)	10 (37.0)	0.55	2
Some	6 (42.9)	11 (40.7)		
A little	1 (7.1)	3 (11.1)		
None	0 (0)	3 (11.1)		
U.S.A. as Primary Residence	8 (57.1)	20 (74.1)	0.43	2.7

Table 1 (cont.)

Return to Mexico				
Often	2 (14.3)	6 (21.4)	0.38	3
Sometimes	2 (14.3)	8 (28.6)		
Rarely	5 (35.7)	10 (35.7)		
Never	5 (35.7)	4 (14.3)		

NS, not significant

Table 2: Physical Activity Levels of Rural and Urban Latino Women

	Rural (N = 14)	Urban (N = 23)	P Value
Participants Categorized as Inactive according to DHHS Guidelines, N(%)	14 (100)	17 (74)	0.04
Light Intensity Activity, *Minutes per week*	1919.6 ± 1038.2	1561.4 ± 766.1	NS
Moderate Intensity Activity, *Minutes per week*	31.86 ± 36.5	101.13 ± 131.9	0.06
Sedentary Activity, *Minutes per week*	4119.8 ± 1634.8	3360 ±1154.4	NS
Sedentary Activity, *Minutes per week day*	569.8 ± 146.2	521.4 ± 78.8	NS
Sedentary Activity, *Minutes per weekend day*	546.6 ± 132.6	532.9 ± 78.8	NS
Moderate Intensity Activity, *Minutes per week day*	4.1 ± 4.7	14.2 ± 17.6	0.04
Moderate Intensity Activity, *per weekend day*	4.0 ± 4.2	14.4 ± 18.1	0.06

DHHS, Department of Health and Human Services
NS, not significant

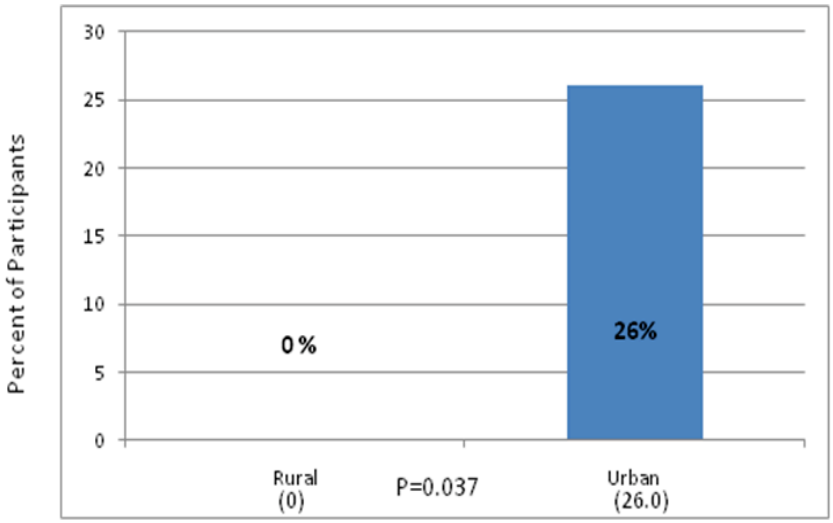

Table 3: Percent of Participants meeting DHHS recommended levels of Physical Activity (150 minutes or more of moderate intensity activity per week)

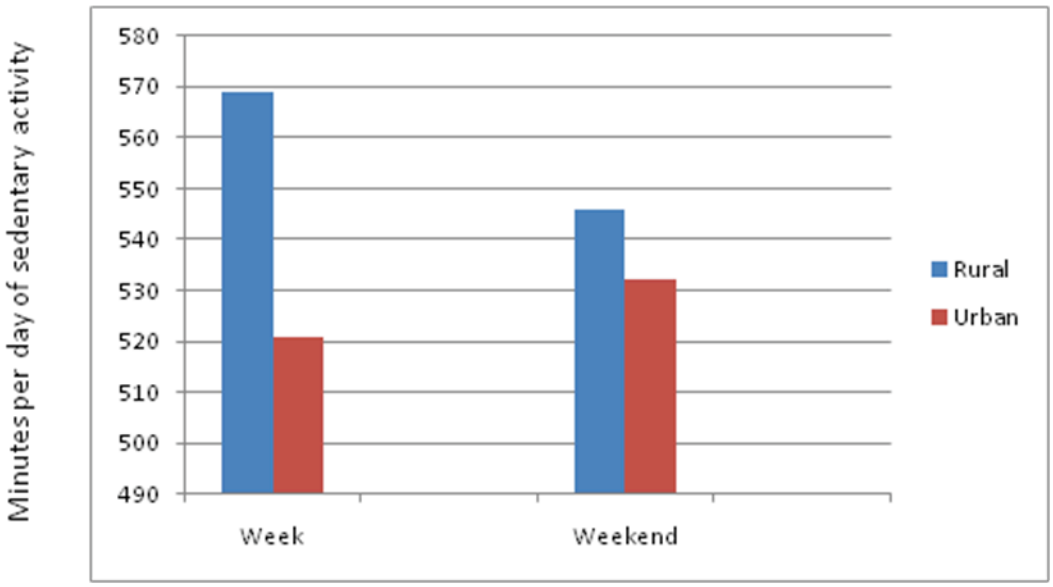

Table 4: Minutes of Sedentary Activity in minutes per day on week versus weekend days

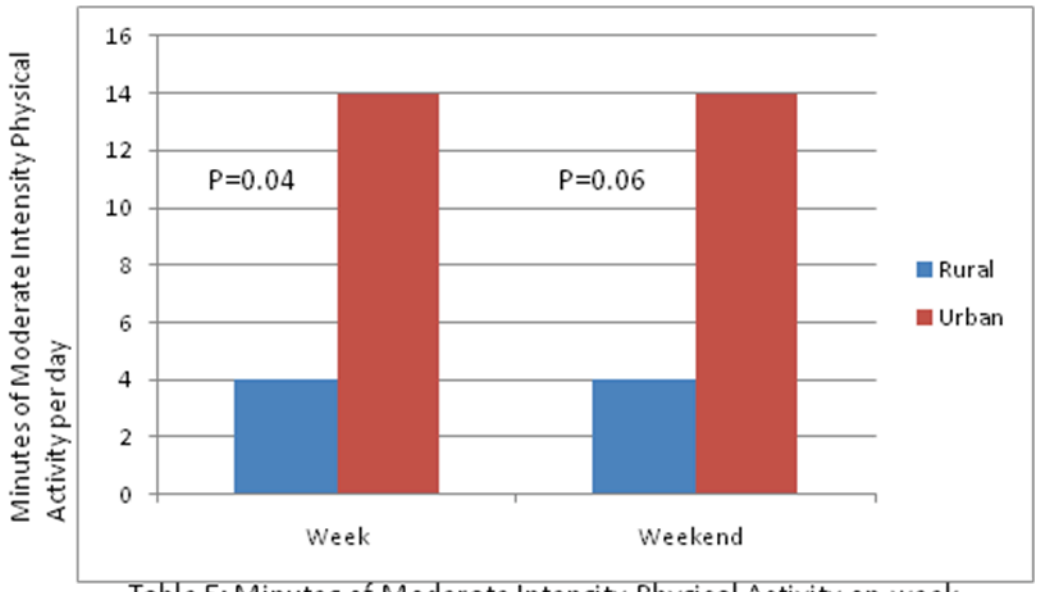

Table 5: Minutes of Moderate Intensity Physical Activity on week versus weekend days

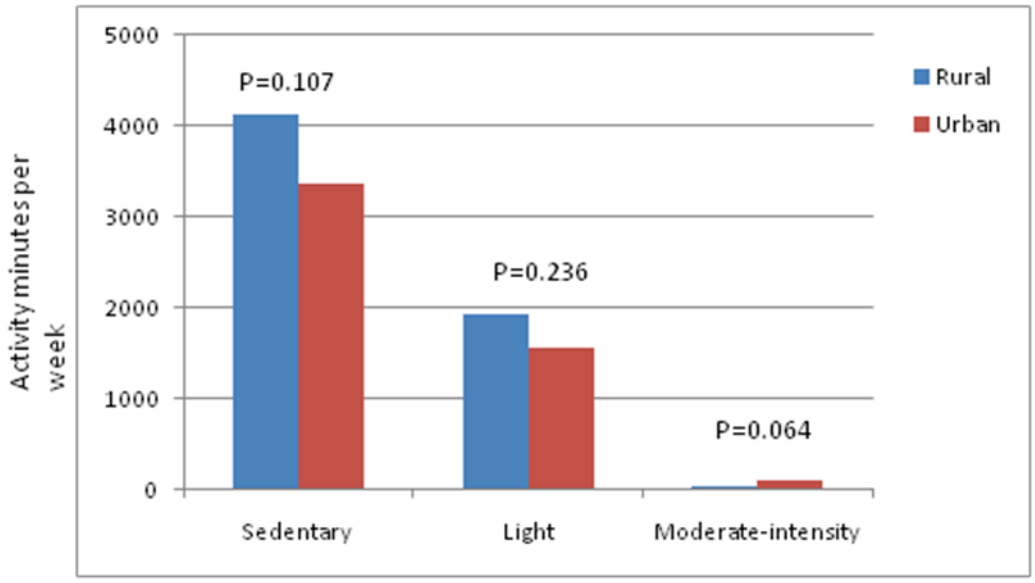

Table 6: Total Minutes per week per Physical Activity Category

Table 7: Neighborhood Perceptions of Latino Women in Rural and Urban Community Sample

	Rural (N = 14)	Urban (N = 28)	P Value	x^2
This is a close knit neighborhood	2.50 ± .90	3.04 ± 1.20	NS	3.01
People around here are willing to help their neighbors	1.9 ± .83	2.8 ± 1.07	NS	7.5
People in this neighborhood generally don't get along with each other	3.4 ± 1.36	2.8 ± 1.17	NS	3.0
People in this neighborhood do not share the same values	2.6 ± 1.20	2.8 ± 1.26	NS	0.47
People in this neighborhood can be trusted	2.3 ± 1.02	3.3 ± 1.37	0.05	9.1

Results were calculated by coding survey answers on a Likert type scale with 1 equaling strongly agree, 2= agree, 3= neutral, 4= disagree, and 5= strongly disagree.
NS, not significant

CHAPTER 5

DISCUSSION

5.1 Strengths and Limitations.

One possible source of bias in this study design is observation bias, more specifically the issue of recall bias with the self report of physical activities during the survey. Older adults may not accurately report their physical activity for the study period because of forgetfulness, declining mental function, or the inability to accurately recall recent events. This sample of the population might also not fully understand the meanings of different physical activities. Evidence of this is provided by comparing the accelerometer data against the survey data. Levels of physical activity may be over or under reported when looking retrospectively at data.

Selection bias was kept to a minimum through a number of ways. To begin with, the exclusion criteria are very limited and will help to recruit as many older adults as possible. By capturing as many participants as possible we will reduce selection bias and make our sample more random.

Information bias was reduced by training all of the research personal in the same way. All research assistants went through a formal training process.

A potential confounder in this study is the issue of age. In individuals above age 65, a great deal of variation can be seen between the ages due to the decline in age. For example, a 65 year old individual is likely to have a very different lifestyle than an 85 year old individual, but both are placed in the same age category as older adult.

Limitations to this study include the issue of geographic areas. Rural and urban areas of the United States are not completely homogenous so the results may not always be widely applied. Great care must be taken when analyzing the results. The ecological fallacy, which is

assuming that individuals in the same area have characteristics of the larger group, must be avoided. Another limitation to this is study is the cross-section design. The information is based on a one time collection of data and does not provide a look into the future or past physical activity levels of these older Latino women.

5.2 Conclusions

Based on the knowledge gathered by this study it is clear that more research is needed in the area of physical activity in older Latino women, in addition to other minority groups. From the demographic data, we were able to see that the composition of the urban and rural population is much different. Differences were seen in the country of birth, time spent in the United States, and other socioeconomic factors like health insurance status. Because of these differences we suggest that levels of physical activity for participants might be affected by certain demographic characteristics.

Results from accelerometery data show an overall low level of moderate-intensity PA participation among this population, with difference ($p=0.06$) between rural (31.86 ± 36.5 min/wk) and urban (101.13 ± 131.9 min/week) subjects. Also, women living in the rural site were significantly ($p=0.04$) less likely to meet the 2008 Department of Health and Human Services Physical Activity recommendation guidelines (150 min/wk of moderate-intensity PA) than their urban counterparts (rural 100% were considered inactive, whereas 74% from the urban site).

The surprising data that was found was the fact that the rural participants of the study reported more favorably towards their neighbors and neighborhood than the urban participants

on all items except one. It is known that the social environment of an urban area can support or damage health (Vlahov et al., 2007). Rural areas are known for sense of community and belonging. However, with the element of immigration and miniority status involved it was predicted that urban areas would feel as favorable towards their neighbors and neighborhood and affect physical activity in a positive way. This is an interesting finding that needs to be explored further. By better understanding all elements of this population's feelings and actions towards physical activity, researchers, medical professionals, and public health professionals can create meaningful interventions that will provide a lasting impact on physical activity, health and the prevention of chronic disease.

5.3 Future Directions

In the future, there are many opportunities for this research to be continued. Inviting participants to take part in a focus group to explore ways in which we can translate our findings into a meaningful community intervention would be beneficial to this population.

We know that the urban and rural Latino older women in this study both fail to meet recommended guidelines for physical activity; however the reasons for not meeting the guidelines varying. Based on our data, these conclusions cannot be drawn. However, a larger sample size might yield more power and help to clarify the trends found in the current data.

Environment of residents has been proposed as a deterrent for physical activity including: lack of indoor facilities, programs/age appropriate classes, transportation, and availability of senior centers, uneven surfaces, and travel distance. Regardless of the barrier, real or perceived, individuals are inhibited from meeting recommended levels of physical activity (Patterson et al., 2004). A more focused study examining barriers and perception towards physical activity in rural and urban areas could provide useful information to policy makers, public health officials, and

medical providers. As America prepares for a growing number of older adults, this information will prove invaluable to the quality of life and health outcomes of these individuals.

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