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Acculturation and Social Support as Predictors of Physical Activity in a Web-based Intervention for Latinas

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ACCULTURATION AND SOCIAL SUPPORT AS PREDICTORS OF PHYSICAL ACTIVITY IN A WEB-BASED INTERVENTION FOR LATINAS

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ABSTRACT

Latinas in the United States report high levels of physical inactivity and are disproportionately burdened by associated chronic diseases, demonstrating the need for innovative approaches to reducing these disparities. The purpose of the current study was to evaluate self-reported changes in physical activity and social support, and to examine the association between physical activity and acculturation, following a one month culturally and linguistically adapted, theory-driven (Social Cognitive Theory and Transtheoretical Model) Internet-based physical activity intervention for Latina adults.

Data was collected from Spanish-speaking Latinas (N=24) between the ages of 21-61 years (M=35.17, SD=11.22) enrolled in a web-based physical activity pilot study. Paired t-tests and Wilcoxon signed rank tests were used to assess pre-post changes in self-reported physical activity and social support for exercise from baseline to one-month. Bivariate regression analyses were used to assess whether pre-post changes in social support were associated with pre-post changes in physical activity, and whether baseline level of acculturation was associated with pre-post changes in physical activity.

Study completers reported significant increases in moderate-to-vigorous physical activity from an average of 29.05 (SD= 34.01) minutes per week at baseline to 125.48 (SD= 148.22) minutes per week at one-month (p= .003). Non-parametric tests also indicated significant increases in physical activity from baseline to one month. There

were no significant changes in social support from baseline to one month and no significant association between pre-post changes in social support and pre-post changes in physical activity. Baseline level of acculturation was not significantly associated with pre-post changes in physical activity.

Results from this study provide preliminary support for the use of culturally adapted Internet-based interventions for promoting physical activity among Latina adults. Further research with larger, more diverse samples of Latinas and randomized controlled designs is necessary to understand the impact of using Internet-based interventions for reducing physical activity disparities among Latinas, as well as the relationship between psychosocial variables such as social support and acculturation and physical activity in this community.

Keywords: Physical Activity, Internet, Latina, Acculturation, Social Support

DEDICATION

This dissertation is dedicated to my friends and family, especially Lila, Nestor, David and Irne. Thank you for your ongoing encouragement, humor and always being so supportive throughout my studies.

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CHAPTER 1

THE PROBLEM

Introduction

Lack of physical activity, or physical inactivity, is the fourth leading risk factor for global mortality and accounts for approximately 3.2 million deaths worldwide (World Health Organization, 2013). Physical activity has established benefits for improving both physical and psychological health (Centers for Disease Control and Prevention, 2011). For example, performing regular physical activity can reduce the risk of early death and illnesses such as heart disease, stroke, type 2 diabetes, high blood pressure, colon and breast cancers, and can also help to control weight, improve cardiorespiratory and muscular fitness, and reduce depression (Centers for Disease Control and Prevention, 2012).

To achieve health benefits associated with physical activity, the U.S. Department of Health and Human Services recommends that adults ages 18-64 should engage in one of the following weekly amounts of aerobic physical activity: a) 150 minutes of moderate-intensity physical activity, b) 75 minutes of vigorous intensity aerobic activity, or c) a combination of both. Moreover, additional health benefits can be achieved by further increases in physical activity (Centers for Disease Control and Prevention, 2012). In addition to performing aerobic physical activity, the U.S. Department of Health and

Human Services recommends that adults perform muscle–strengthening activity two or more days of the week (Centers for Disease Control and Prevention, 2012).

Despite the benefits of regular performance of physical activity, the majority of adults in the United States are insufficiently active. National data indicate that only 48% of Americans achieve the recommended guidelines (Centers for Disease Control and Prevention, 2011). Moreover, physical inactivity and underactive lifestyles are disproportionately high among certain racial and ethnic minority groups, particularly the Latino population (U.S. Department of Health and Human Services, November 2000). Latino adults report a higher prevalence of engaging in no leisure time physical activity (42.2%) and not achieving the national guidelines for physical activity (59.8%) than any other racial or ethnic group (Go et al., 2013). Further, Latinas (referring to female Latinos or Hispanic females) in the United States are even less physically active than Latino men (Schiller, Lucas, Ward, & Peregoy, 2012). For example, in 2010, 31% of Latinas met the national guidelines for aerobic physical activity; which is an approximate 15% lower prevalence than their non-Hispanic White counterparts. Moreover, 48.6% of Latinas participated in no leisure-time aerobic activity compared to 29.9% of White non-Hispanic females (Schiller et al., 2012).

Latinas have a disproportionate prevalence of physical activity-related health and medical conditions. They are 1.7 times more likely than non-Hispanic White women to have a diagnosis of diabetes and are 1.5 times as likely to die from diabetes as White women (Schiller et al., 2012). Further, Latinas are also 20% more likely to have a stroke (Schiller et al., 2012) and 40% more likely to be obese than non-Hispanic White women (National Center for Health Statistics, 2011).

Physical activity related disparities among Latinas indicate the need for culturally and linguistically appropriate physical activity interventions targeting this population. Given the unique social and cultural factors that can influence health-related behaviors among Latinas (D'Alonzo, 2012; Evenson, Sarmiento, Macon, Tawney, & Ammerman, 2002; Juarbe, Turok, & Pérez-Stable, 2002; Ramirez, Chalela, Gallion, & Velez, 2007), it is important for researchers to consider these factors when developing physical activity promotion efforts for this underserved population. For example, previous research has shown that barriers to physical activity among Latinas in the United States include lack of English language skills (Evenson et al., 2002; Juarbe et al., 2002; Ramirez et al., 2007), lack of time, family responsibilities, lack of social support (Evenson et al., 2002; Juarbe et al., 2002; Martinez, Arredondo, Perez, & Baquero, 2009; Mier, Medina, & Ory, 2007; Ramirez et al., 2007), perception of weight and body image, lack of safe places to exercise, fear of immigration authorities, and lack of transportation (Martinez et al., 2009).

Many of these barriers to participation in physical activity among Latinas appear to be shaped by deeply embedded cultural norms and values, and traditional gender roles (Castaneda et al., 2002; Comas-Dias, 1988; Stevens, 1973). For instance, Latinas have described the perception of physical activity and sports as being unfeminine (D'Alonzo, 2012) or male-oriented (D'Alonzo & Fischetti, 2008) as a constraint to perfoming physical activity. Moreover, traditional values and gender roles among Latinas can emphasize self-sacrifice and putting the needs of the family before a woman's own needs and defines a woman's self worth based on what she can do for others (D'Alonzo, 2012). For many Latinas, this devotion to the family is so highly respected, that performing

physical activity can be perceived as a selfish indulgence and being neglectful of her family's needs (D'Alonzo, 2012). In a qualitative study of barriers to physical activity among Latinas, Martinez and colleagues (2009) reported that although the women were aware of the health benefits of physical activity, family responsibilities took precedence over becoming more physically active. For example, one participant stated that if she had extra money, she would prefer to buy something for her child than to spend it on attending a gym (Martinez et al., 2009). Similarly, another participant in this study reported that although she would love to go to the gym, spending an hour there would be like robbing time away from her children (D'Alonzo, 2012).

Latinas have also reported the lack of social and family support as a barrier to physical activity (Ramirez et al., 2007) and noted the importance of social support as a means to becoming more physically active (Martinez et al., 2009). For Latina immigrants born outside of the United States, the loss of social support from extended family and friends that they had in their native countries prior to living in the United States was a contributing factor to physical inactivity (D'Alonzo, 2012). Further, Latinas have reported that (living in the United States) they felt overwhelmed by the everyday responsibilities (i.e., taking care of their families, going out to work) they faced with less support from friends and family; thus limiting their opportunities to engage in physical activity. They discussed that along with the demands of family responsibility, the stressors of acculturation, such as lack of English language skills and undocumented status, made them feel more socially isolated or dependent on their spouses or partners, thus less likely to go outside of the home alone (D'Alonzo, 2012). An additional barrier to physical activity reported by Latinas was the lack of support from husbands or partners who did

not like them to exercise with other men (Ramirez et al., 2007) and expressed disaproval of them wearing exercise clothes in public and potentially attracting attention from other men (Martinez et al., 2009).

Many of the aforementioned cultural beliefs and attitudes regarding physical activity may also be tied to the extent that the women have adapted, or have become acculturated, to the customs of the United States (Coronado, Thompson, McLerran, Schwartz, & Koepsell, 2005). Acculturation refers to the process of adaptation or assimilation by an ethnic or racial group to that of a new culture (Berry, 1989), and can result in changes in values, attitudes and behaviors (Cuéllar, Arnold, & Maldonado, 1995). Acculturation has been associated with many health behaviors (Daviglus et al., 2012), including performance of physical activity (Crespo, Smit, Carter-Pokras, & Andersen, 2001; Evenson, Sarmiento, & Ayala, 2004; Marquez & McAuley, 2006a). Among previous studies examining the association of acculturation and physical activity in Latinos, a number have suggested that Latinos who have higher levels of acculturation report performing higher levels of physical activity (Crespo et al., 2001; Evenson et al., 2004; Ghaddar, Brown, Pagán, & Díaz, 2010; Van Wieren, Roberts, Arellano, Feller, & Diaz, 2011). However, findings on the relationship between acculturation and physical activiy in Latinos remains unclear (Jurkowski, Mosquera, & Ramos, 2010; Marquez & McAuley, 2006a), and merits further investigation.

Disparate levels of physical activity among Latinas and the distinctive cultural factors influencing health behaviors indicate the vital need for new strategies to promote physical activity in this underserved population. Previous efforts for increasing physical activity among Latinas adults have generally involved in-person or face-to-face

interventions (Barrera, Toobert, & Strycker, 2014; Bopp, Fallon, & Marquez, 2011; Castaneda et al., 2002; Castro, Sallis, Hickman, Lee, & Chen, 1999; Hovell et al., 2008; Keller & Cantue, 2008; Leeman-Castillo, Beaty, Raghunath, Steiner, & Bull, 2010), and have used strategies such as increasing social support as a means of promoting physical activity (Avila & Hovell, 1994; Barrera et al., 2014; Mier et al., 2011; Olvera et al., 2010; Pekmezi et al., 2009; Staten et al., 2004). Although a number of these have shown success for increasing physical activity (Hovell et al., 2008; Mier et al., 2011; Staten et al., 2012) they are still subject to barriers of in-person interventions commonly reported by Latinas such as lack of transportation, fear of immigration authorities, lack of time and/or taking time away from family (D'Alonzo, 2012; Martinez et al., 2009). Innovative approaches such as Internet-based interventions for promoting physical activity have the potential to overcome many of these barriers and can provide several advantages over face-to-face programs. For example, Internet-based interventions can be individually tailored to address physical activity needs and can provide immediate feedback to participants, have less reliance on bilingual and bicultural research staff, and can reach a large number of individuals at a relatively low cost. Internet technology may provide an ideal channel to intervene in promoting physical activity and reducing related health disparities among Latinas; however, the lack of published literature on Internet-based physical activity intervenetions in this population necessitates further research. The purpose of this study was to evaluate findings from a culturally and linguistically adapted, theory-driven (Social Cognitive Theory and Transtheoretical Model) Internet-based physical activity intervention for Latina adults.

Statement of the Problem

The current study evaluated self-reported changes in physical activity and social support following a one-month, theory driven- Social Cognitive Theory (Bandura, 1986) and Transtheoretical Model (Prochaska & DiClemente, 1983), Internet-based physical activity intervention and to examine the relationship between physical activity and acculturation. The specific aims of the study were as follows:

1. Assess self-reported changes in physical activity, as measured by the Seven Day Physical Activity Recall (Sallis et al., 1985), from baseline to one-month assessment.
2. Assess self-reported changes in social support, as measured by the Social Support for Exercise Scale (Sallis, Grossman, Pinski, Patterson, & Nader, 1987), from baseline to one-month assessment.
3. Evaluate whether changes in social support from baseline to one-month assessment were associated with changes in physical activity.
4. Examine if baseline levels of acculturation, as measured by the Short Acculturation Scale for Hispanics (Marín, Sabogal, VanOss Marin, Otero-Sabogal, & Perez-Stable, 1987), were associated with changes in physical activity from baseline to one-month assessment.

Hypotheses

The following hypotheses were formulated to correspond with the aforementioned specific aims:

1. Participants will demonstrate an increase in self-reported physical activity from baseline to one-month assessment.
2. Participants will report an increase in social support from baseline to one-month assessment.
3. Participants with increased social support from baseline to one-month assessment will self-report greater increases in physical activity.
4. Participants who report higher acculturation at baseline will demonstrate greater increases in physical activity from baseline to one-month assessment.

Assumptions

While participants generally appeared to read and understand the study materials and answer the questions to the best of their ability, it was assumed that they would ask for clarification if any confusion arose, and try to answer surveys in a truthful and honest manner.

Limitations

Results of questionnaires and Seven Day Physical Activity Recall relied on self-report measures and thus were subject to participant and interviewer bias. The primary physical activity outcomes was assessed using the Seven Day Physical Activity Recall, a structured interview in which participants were asked to recall the previous 7 days of physical activity, which was limited to memory and honesty of participants. However, the study corroborated self-reported physical activity findings from the Seven Day Physical Activity Recall with an objective measure (accelerometry) of physical activity.

Operational Definitions

Accelerometer: an activity monitor worn on the hip to provide an objective measure of intensity, frequency and duration of physical activity performed.

Acculturation: The process of adaptation or assimilation by an ethnic or racial group to that of a new culture (Berry, 1989).

Latino(a): any person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race (Office of Management and Budget, 1997). Latina refers to Latino or Hispanic female.

Physical Activity: Any movement of the body produced by skeletal muscles that requires more energy expenditure than resting.

Social Support for Physical Activity: The extent to which encouragement or approval from important others in an individual's social network (friends, peers and family members) influences their performance of physical activity.

Study completers: Participants who provided data at both baseline and one-month assessments in the current study.

Summary

Internet-based interventions may be a feasible approach for addressing physical activity-related health disparities among Latinas. Such programs can overcome common barriers to in-person interventions and have the potential to reach a large number of women at a relatively low cost. Despite the rapid growth in Internet access among Latinos (Fox & Livingston, 2007; U.S. Department of Commerce, 2011), there is a paucity of research on Internet-based interventions for promoting physical in this

population. The current study evaluated changes in physical activity, social support, and the relationship of acculturation to physical activity following a one-month theory-driven Internet-based intervention for Latina adults. The Internet may serve as an innovative means for promoting physical activity and reducing physical activity-related health disparities in this underserved population.

CHAPTER 2

BACKGROUND

The Latino Population in the United States

Latinos are the fastest growing ethnic minority in United States (Humes, Jones, & Ramirez, 2011; WomensHealth.gov, 2012), accounting for more than half of the population growth in the United States between 2000 and 2010 (Humes et al., 2011). The population of Latinos in the United States has increased from 9.1 million in 1970 to 52 million in 2011, and is projected to increase to 132.8 million by the year 2050 (United States Department of Commerce, 2012). This rapid growth in population may be attributed in part to higher birthrates among Latinas compared to non-Hispanic White women (17.5 vs. 10.8 per 1,000 births respectively) (Hamilton, Martin, & Ventura, 2012), as well as immigration from Latin American countries into the United States (Acosta & DelaCruz, 2011).

Immigration trends in the United States have dramatically shifted over the past 50 years (Acosta & DelaCruz, 2011). In the 1960's the majority (75%) of foreign-born residents (defined as non-United States citizen at time of birth) were born in Europe, whereas more than half of the 40 million foreign-born individuals in the U.S. in 2010 were from Latin American countries (Acosta & DelaCruz, 2011). Furthermore, the largest increase in language spoken in the United States between 1980 and 2007, other than English, has been Spanish. As of 2007, 20% (55.4 million) of the United States

population spoke a language other than English at home, with Spanish being the most commonly reported language (34.5 million people in U.S. spoke Spanish in the home) (Hamilton et al., 2012).

Latinos in the United States come from many different countries and comprise a heterogenous group. Within the Latino population, there is great variation based on country of origin in terms of sociodemographic factors that can influence performance of physical activity (Neighbors, Marquez, & Marcus, 2008). For example, one study found that among Latinos subgroups, Mexicans had the greatest number of children and had the lowest level of education, whereas Cubans were the least likely to have children and were the most educated. Cubans were also the most likely to be married and were the least acculturated. Physical activity also varied greatly among Latino subgroups. Cuban and dominicans reported the lowest level of leisure-time physical activity while Mexican Americans reported being the most active (Neighbors et al., 2008). Given the rapidly changing landscape of Latinos in the United States, the broad range of cultural and linguistic backgrounds, and the physical activity-related health disparities within this population, it is critical to understand the unique factors that influence health-related behavior in this group.

Previous Physical Activity Interventions with Latinas

Past interventions for promoting physical activity in Latina adults have included the use of face-to-face approaches (Ayala & Team, 2011; Keller & Cantue, 2008; Marquez & Wing, 2013), mail-based approaches (Chen et al., 1998; Pekmezi et al., 2009), or a combination of more than one of these strategies (Albright et al., 2005). In a

literature search conducted for the current study, no published studies were located on outcomes of Internet-based physical activity interventions exclusively used in Latina adult populations; however, a select few have used computer-based programs accessible at community locations (Christian et al., 2011; Leeman-Castillo et al., 2010).

Past physical activity interventions using face-to-face approaches have commonly been implemented in community-based settings (Avila & Hovell, 1994; Castaneda et al., 2002; Keller & Cantue, 2008; Poston et al., 2001). For example, in a 12-week culturally adapted diet and physical activity intervention for Latinas, participants attended weekly group meetings at a community research center where they received instruction for becoming more physically active. They also received pedometers, step recommendations of reaching 10,000 steps per day, and were encouraged to self-monitor pedometer steps. Although participants in this study did not report significant increases in physical activity, they did report other health benefits such as significant weight loss (Marquez & Wing, 2013).

Similarly, in another intervention that included Latina adults (73% of study sample), participants attended 8-weeks of classes to learn how to become more physically active (e.g., overcoming barriers for physical activity, setting goals). Following the classes, they were randomized to receive either a mail-based intervention, where they received print information on how to become more physically active or a mail plus phone-based intervention where they received theory-based individually tailored information in the mail and weekly telephone counseling about physical activity. Participants in both groups reported significant increases in walking at all follow-up assessments (Chen et al., 1998).

Although previous face-to-face and telephone-based programs have shown favorable health outcomes, these interventions are only available on set days/times and may not provide the flexibility of being accessed at any given time; thus, making it more difficult for Latinas with limited time, work or family responsibilities to participate. Computer-based programs, such as those reported by Christian et al. (2011) and Leeman-Castillo et al. (2010) can help overcome barriers of lack of time by providing greater flexibility of access. To promote physical activity, Leeman-Castillo (2010) used self-administered programs via kiosks located at community-based organizations and health clinics where participants (64% Latino adults) could receive personalized feedback in either English or Spanish on physical activity and healthy behaviors. Significant improvements were reported from baseline to the two-month follow-up for participants meeting physical activity guidelines of 30 minutes moderate-to-vigorous activity most days of the week; the number of participants meeting these guidelines increased from 33 at baseline to 49 at two-month follow-up at the community locations, and from 45 to 65 at clinic locations (Leeman-Castillo et al., 2010).

Assessment of Physical Activity in Latinas

In many previous interventions promoting physical activity with Latinas, researchers have assessed physical activity using subjective measures. One of the more commonly used measures of physical activity in interventions with Latinas is Sallis' (1985) Seven Day Physical Recall (Albright et al., 2005; Castaneda et al., 2002; Keller & Cantue, 2008; Poston et al., 2001), a semi-structured interview that assesses frequency, duration and intensity of physical activity. Researchers have also assessed physical

activity other using self-reported measures such as the Leisure Time Physical Activity Questionnaire (Staten, Scheu, Bronson, Pena, & Elenes, 2005), Paffenbarger Activity Questionnaire (Marquez and Wing, 2013), Arizona Activity Frequency questionnaire (Staten et al., 2004), the Lifestyles Behavior Questionnaire (Kim, Koniak-Griffin, Flaskerud, & Guarnero, 2004) or the use of activity logs (Keller & Trevino, 2001). Objective measures of physical activity can help to reduce recall bias or over-reporting of physical activity (Sallis & Saelens, 2000); yet, few studies have reported the use of objective measures (Chen et al., 1998; Olvera et al., 2010).

Theoretical Basis of Physical Activity Interventions with Latinos

Previous reviews of interventions that promoted physical activity among Latinas have found that many studies incorporated the use theoretical frameworks (Ickes & Sharma, 2012; Pekmezi, Marquez, & Marcus-Blank, 2009). The most commonly used behavioral frameworks in interventions promoting physical activity with Latinas were the Social Cognitive Theory (Chen et al., 1998; Olvera et al., 2010; Pekmezi et al., 2009; Poston et al., 2001; Staten et al., 2004) and Transtheoretical Model (Albright et al., 2005; Hayashi, Farrell, Chaput, Rocha, & Hernandez, 2010; Mier et al., 2011; Pekmezi et al., 2009; Yan, Wilber, Aguirre, & Trejo, 2009). Several other studies have reported the use of theoretical constructs, such as self-efficacy and social support, in their interventions but did not specifically report the use of a behavioral theory in their interventions (Avila & Hovell, 1994; Bopp et al., 2011; Grassi, Tello, & He, 1999; S. Kim et al., 2004; Lorig, Ritter, & Jacquez, 2005). A common strategy for promoting physical activity promotion studies with Latina adults has been the use of social support. Many studies have

integrated strategies for increasing social support as a means of helping Latinas become more physically active (Albright et al., 2005; Keller, Fleury, Perez, Belyea, & Castro, 2011; Pekmezi et al., 2009; Poston et al., 2001; Staten et al., 2004). In fact, previous studies have shown that social support can be an important determinant of exercise behavior among Latinas (Evenson et al., 2002; Resnick, Orwig, Magaziner, & Wynne, 2002) and can be predictive of exercise maintenance (McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003).

Physical Activity and Social Support in Latinas

Social support refers to the influence that significant others, such as friends and family, have on an individual's performance of a behavior (Uchino, 2004). In past physical activity studies targeting Latina populations, a number have found that social support from both friends and family was associated with performance of physical activity (Albright et al., 2005; Collins, Lee, Albright, & King, 2004; Eyler et al., 1999; Hovell et al., 2008). However, other studies found that social support from friends, but not from family, was related to increased physical activity (Marquez & McAuley, 2006b), or that there was no relationship between social support and physical activity (Eyler et al., 1999).

Previous physical activity promotion efforts with Latinas have targeted social support in their interventions (Albright et al., 2005; Keller, Fleury, Perez, Belyea, & Castro, 2011; Pekmezi et al., 2009; Poston et al., 2001; Staten et al., 2004), and have relied on strategies such as group-based activities (Hovell et al., 2008), and family/friend-based approaches (Marquez & Wing, 2013; Olvera et al., 2010). Group-based physical

activity interventions targeting social support with Latinas have often involved lay health workers, or "promotoras," (Ayala & Team, 2011; Keller, Records, et al., 2011; Keller & Cantue, 2008) who are trained to provide physical activity classes and education (Spinner & Alvarado, 2012; Staten et al., 2004), guide structured exercise sessions such as walking groups (Staten, Scheu, Bronson, Peña, & Elenes, 2005), or provide aerobic/ dance classes (Harralson et al., 2007; Hovell et al., 2008). For example, in a randomized controlled trial conducted by Hovell and colleagues (2008), participants engaged in supervised aerobic dance classes, received exercise and diet counseling sessions, and were assigned a walking 'buddy' to promote social support. The women in the intervention group reported significantly more vigorous exercise and walking than the control group at 12 months. In other group-based physical activity interventions, such as Pasos Adelante (Staten, Scheu, Bronson, Pena, et al., 2005) and Las Mujeres Saludables (Larkey, 2006), community health advisors provided health education classes and structured walking groups to promote social support for exercise. Pasos Adelante included both male and female Mexican American adults in their sample, while Las Mujeres Saludables included solely Latina adults. In both interventions participants reported significant increases in physical activity, from 73.7 minutes per week pre-program to 138.1 minutes per week post-program moderate walking at the 12-week post-program assessment (Staten, Scheu, Bronson, Peña, et al., 2005) and from 65.15 to 122.40 minutes per week physical activity from baseline to the 12-week follow-up (Larkey, 2006), respectively.

In another study, Camina por Salud, a randomized trial comparing two walking interventions for Latinas, the promotoras led walking groups in participants' neighborhoods and provided health education counseling to participants. Participants

were also paired with each other as walking partners to further promote social support for physical activity. Participants in this study reported that their walking partner became a great friend and the primary motivator for engaging in and sustaining physical activity. Although there were no significant improvements in physical activity, results indicated favorable changes in body fat and weight in both groups (Keller & Cantue, 2008).

Other physical activity promotion efforts for Latinas have targeted social support by incorporating friends or family into their interventions. In the BOUNCE (Olvera et al., 2010) intervention, Latina mother/daughter dyads were recruited to participate in various modes of physical activity, including structured group aerobic dance sessions, sport or free play activities sessions, and behavioral counseling. There were no significant increases in the mothers' physical activity levels but the daughters in the experimental group showed an increase in aerobic capacity, as measured by the 20 meter endurance shuttle run at the 12-week assessment (Olvera et al., 2010).

In sum, several interventions that promoted social support among Latinas have increased physical activity. While other interventions promoting social support for exercise did not show significant improvements in physical activity, they did report other favorable health outcomes such as improvements in weight and body fat (Keller & Cantue, 2008), aerobic capacity (Olvera et al., 2010), or establishment of a walking partner that motivated performance of physical activity (Keller & Cantue, 2008). Given the promising results thus far, promoting social support for physical activity may be a useful strategy for behavior change in Latinas and further investigation is warranted.

Acculturation and Physical Activity

In addition to social support, another factor that may be associated with physical activity behavior among Latina adults is acculturation. Research examining the association between acculturation and physical activity has shown mixed findings. Some studies suggest that Latinos in the United States with higher levels of acculturation engage in greater amounts of physical activity (Crespo et al., 2001; Evenson et al., 2004; Ghaddar et al., 2010; Van Wieren et al., 2011). Conversely, other studies have found that more acculturated participants reported lower physical activity levels (Jurkowski et al., 2010; Marquez & McAuley, 2006a), or found no relationship between physical activity and acculturation (Banna, Kaiser, Drake, & Townsend, 2012; Cantero, Richardson, Baezconde-Garbanati, & Marks, 1999; Keller & Cantue, 2008; Wilbur, Chandler, Dancy, & Lee, 2003).

Inconsistent findings in the relationship between acculturation and physical activity among Latinos may be related to the various ways acculturation has been measured in existing literature. Some studies have measured acculturation using a single question to identify the individual's primary language (Bungum, Thompson-Robinson, Moonie, & Lounsbery, 2011), while others have assessed acculturation using specific, validated measures such as Hazuda, Haffner, Stern, & Eifler's (1988) *Hazuda Acculturation and Assimilation Scale* (Keller & Cantue, 2008; Suarez, 1994), or Marín, Sabogal, VanOss Marin, Otero-Sabogal, & Perez-Stable's (1987) *Short Acculturation Scale* (Juarbe et al., 2002). Additional studies have also assessed acculturation by using a series of questions, such as preferred language, years in United States, and/or place of birth (Banna et al., 2012; Crespo et al., 2001; Evenson et al., 2004).

Although acculturation has been assessed using various questions and instruments, there is no set standard for measuring this concept. Researchers have defined acculturation as a process that involves adopting the behaviors and customs of a new culture (Abraido-Lanza, White, & Vasquez, 2004); therefore, using a single question such as language spoken or years residing in the United States, may not provide an accurate measure of this concept. While a number of instruments have been developed to measure acculturation with Latinos, (Cortés et al., 2003; Hazuda et al., 1988; Marín et al., 1987), many of these measures were intended for use with specific populations or subgroups, such as Mexican Americans (Deyo, Diehl, Hazuda, & Stern, 1985), Cubans (Szapocznik, Scopetta, Kurtines, & Aranalde, 1978) or Puerto Ricans (Cortés et al., 2003), and therefore may not be generalizable to broader populations of Latinos. The *Short Acculturation Scale for Hispanics* (Marín et al., 1987) is a 12-item acculturation scale that was developed for use with multiple Latino subgroups, such as Mexican American, Puerto Ricans and Central Americans (Marín et al., 1987). The *Short Acculturation Scale for Hispanics* demonstrates levels of reliability and validity comparable to other scales (Marín et al., 1987), and has been widely used with Latino populations to measure acculturation (Evenson et al., 2004; Ghaddar et al., 2010; Mainous, Diaz, & Geesey, 2008; Marquez & McAuley, 2006a); thus it will be used in the current study.

Moreover, inconsistent associations between acculturation and physical activity may also be confounded by physical activity assessment issues. Many studies examining this relationship have relied on various self-reported measures to assess physical activity with established reliability and validity such as Seven Day Physical Activity Recall

(Keller & Cantue, 2008); while others have used physical activity logs (Keller and Cantue, 2008) or other self-reported measures (Evenson et al., 2004; Ghaddar et al., 2010; Jurkowski et al., 2010; Marquez & McAuley, 2006a).

Despite the previous research on the association of acculturation and physical activity among Latinos, the relationship remains unclear (D'Alonzo, 2012) and merits further investigation. Gaining a clearer understanding of the relationship between physical activity and acculturation can help to inform future efforts to promote physical activity in Latinas and allow us to better tailor these interventions to their specific needs. For example, foreign-born Latinas who immigrated to the United States have reported that as children they had no female role models for physical activity and rarely saw their mothers participate in leisure-time physical activity (D'Alonzo, 2012), or viewed weight loss as a sign of poor health, and therefore avoided exercise (Martinez et al., 2009). On the contrary, a United States-born Latina college student with a higher level of acculturation may have different role models, body image and perceptions regarding physical activity than Latinas who have recently immigrated to the United States or are less acculturated. Thus, a tailored physical activity intervention for the lower acculturated Latina could address concerns over weight loss or lack of physically active role models; whereas these issues may be less relevant to a higher acculturated Latina. Web-based interventions have the potential to provide individually tailored feedback to participants and may be effective in promoting physical activity in Latinas.

Web-based Technology for Promoting Physical Activity

The use of Internet technology may be an ideal method for the delivering physical activity interventions to Latinas. Internet-based interventions can provide an innovative approach to help Latinas overcome many of the barriers of in-person physical activity interventions, such as time constraints, lack of transportation, lack of childcare and fear of immigration authorities (D'Alonzo, 2012; Martinez et al., 2009). They have the ability to provide immendiate feedback to participants and can be conveniently accesed at any time and from any Internet-accessible location. Moreover, Internet-based interventions have the potential to reach a large number of inviduals at a relatively low cost. Despite a rapid increase in access to Internet technology among Latinos over the past few years (Fox & Livingston, 2007; U.S. Department of Commerce, 2011) literature on Web-based interventions to promote physical activity in Latinas remains scarce.

The concept of "digital divide," or digital inequality, has been used to describe the differential access to computer technology experienced by certain racial and socioeconomic groups (Dimaggio, Hargittai, Celeste, & Shafer, 2004; Graham & Smith, 2001). However, recent evidence on increasing Internet access among Latinos suggests that this digital inequality has been rapidly decreasing. For example, in recent years broadband Internet access at home has continued to rise in Latino households from 29% in 2006 (Fox & Livingston, 2007) to 45.2% in 2010 (U.S. Department of Commerce, 2011). Moreover, Latinos reported using their cell phones to access the Internet slightly more than non-Hispanic Whites (31% vs. 29%) (Livingston, 2011), and were more likely than non-Hispanic Whites to have used the Internet for accessing information on diet, weight loss and physical activity in recent years (McCully, Don, & Updegraff, 2013).

The use of Internet-based technology to promote physical activity is appealing as such interventions are accessible 24 hours a day, 7 day a week (Marcus, Ciccolo, & Sciamanna, 2009); thus, helping to reduce commonly reported barriers to in-person interventions, such as lack of transportation and fear of immigration authorities (D'Alonzo, 2012). Internet-based interventions can also provide convenient access to Spanish language physical activity information and resources, thus reducing language-related barriers, such as lack of culturally appropriate resources and reliance on Spanish-speaking staff or activities at community centers and parks. Furthermore, Internet-based physical activity interventions provide additional advantages over phone-based interventions as phone-based interventions require more staff time to implement and may not always be available at convenient times for participants. Internet-based interventions also provide advantages over print or mail-based interventions due to the interactive nature and instant access to web-based components. For example, Internet-based interventions can incorporate interactive features such as exercise videos with music (which can promote enjoyment of exercise, provide role models for physical activity, and visual instruction on how to exercise) and online forums (to provide social support) where participants can interact with other participants and/or research staff. Internet-based interventions allow participants to answer questionnaires online (e.g., psychosocial questionnaires, language preference for interventions) and receive immediate tailored feedback, whereas mail-based interventions have a time lag for providing feedback.

Past reviews (Ciccolo, Lewis, & Marcus, 2008; Hamel, Robbins, & Wilbur, 2011; Joseph, Durant, Benitez, & Pekmezi, 2013; Lau, Lau, Wong del, & Ransdell, 2011; van den Berg, Schoones, & Vliet Vlieland, 2007; Vandelanotte, Spathonis, Eakin, &

Owen, 2007), and meta-analyses of web-based physical activity interventions (Davies, Spence, Vandelanotte, Caperchione, & Mummery, 2012; Jenkins, Christensen, Walker, & Dear, 2009), have shown support for using the Internet as a delivery channel for promoting physical activity in samples of primarily non-Hispanic White participants. Common approaches for delivering web-based physical activity interventions include the use of email to deliver intervention messages (Plotnikoff, McCargar, Wilson, & Loucaides, 2005; Rovniak, Hovell, Wojcik, Winett, & Martinez-Donate, 2005; Sternfeld et al., 2009), using both website and email approaches (Bosak, Yates, & Pozehl, 2010; Gow, Trace, & Mazzeo, 2010; Harvey-Berino, Pintauro, & Gold, 2002), or a combination of multiple strategies such as website access, email and text messages (Hurling et al., 2007). For example, in a randomized controlled trial for promoting physical activity among middle-aged women, the intervention consisted of access to an interactive website that provided feedback promoting physical activity as well as weekly emails to encourage physical activity. The women in the intervention group increased their moderate-to-vigorous physical activity from baseline to three months by 32 minutes per week, whereas the control group decreased by 25 minutes per week (Dunton & Robertson, 2008).

Web-based interventions for promoting physical activity have targeted various predominantly non-Hispanic White populations including overweight and obese adults (Harvey-Berino, Pintauro, Buzzell, et al., 2002; Harvey-Berino, Pintauro, & Gold, 2002; Patrick et al., 2011; Smith, Carr, Dorozynski, & Gomashe, 2009) and those diagnosed with type II diabetes (Glasgow, Boles, McKay, Feil, & Barrera, 2003; Kim & Kang, 2006; McKay, King, Eakin, Seeley, & Glasgow, 2001), as well as university students and

worksite employees (Cook, Billings, Hersch, Back, & Hendrickson, 2007; Faghri et al., 2008). However, few have focused on ethnic and racial minority groups, such as Latinos (Lachausse, 2012; Magoc, Tomaka, & Bridges-Arzaga, 2011), despite the obvious need and likely appeal to this group.

Despite the paucity of published literature on Internet-based physical activity interventions exclusively targeting Latino populations, a few studies have included noteworthy samples of Latinos (Lachausse, 2012; Magoc et al., 2011). In a study of male and female students (44% Latinos) at a university with high Latino enrollment, the WebCT platform (a commercially available, course technology program) was used to implement a physical activity promotion intervention (Magoc et al., 2011). Participants were randomly assigned to receive either the intervention or control condition. Participants in the intervention group received an initial 15-minute session on how to use the WebCT program, followed by seven theory-based lessons on topics such as goal setting, self-efficacy and barriers for physical activity. Participants assigned to the control condition received an initial 15-minute session explaining the study and use how to use WebCT, followed by very basic physical activity information and did not receive any of the WebCT lessons provided by the intervention. Results indicated that participants in the intervention group reported significantly greater increases in days of moderate intensity physical activity compared to the control group (Magoc et al., 2011).

In another 12-week Internet based physical activity intervention with a 44% Latino sample, participants were randomized to one of three conditions 1) access to My Student Body website, an interactive web-based that provided online assessments with tailored feedback, learning modules on nutrition and fitness, and links to access further

website access information (Ask the Expert, Student Voices, College News), and 2) a two-hour weekly on-campus physical activity course, that addressed issues such as weight management, nutrition and exercise, and overall wellness, or 3) a no contact control group. However, there were no significant improvements in physical activity in any of the three groups (Lachausse, 2012). Neither the Magoc et al. (2011) or LaChausse et al. (2012) studies reported the use of culturally adapted materials in their interventions, and although positive improvements in physical activity were reported in Magoc et al.'s (2011) study despite the use culturally adapted materials, the population of Latinos may not be representative of the broader Latino population in the United States. College students in the United States generally have to meet certain admission requirements (e.g., graduation from a United States high school or TOEFL English language test) suggesting that these individuals may have higher language proficiency and perhaps even higher acculturation level. In a search of literature conducted for the current study, as well as previous reviews of Internet-based interventions (Ciccolo et al., 2008; Joseph et. al, 2013; van den Berg et al., 2007; Vandelanotte et al., 2007), no other studies that reported a substantial population of Latino participants were identified.

The limited number of Internet-based physical activity interventions including Latinas in their samples suggests the need to explore the use of Internet technology to promote physical activity in this underserved population. Previous Internet-based interventions have shown success at increasing physical activity in predominantly White samples of college students (Glasgow et al., 2010; Glasgow et al., 2012; Grim, Hortz, & Petosa, 2011), underactive adults (Carr et al., 2012; Marcus et al., 2007) and overweight adults (Tate, Wing, & Winett, 2001), and adults diagnosed with diabetes (McKay et al.,

2001; Richardson et al., 2007). Furthermore, Internet-based interventions with Latinas have shown success in promoting health-related behaviors such as smoking cessation (Muñoz, 2006), treatment of depression (Moreno, Chong, Dumbauld, Humke, & Byreddy, 2012), and sexual risk reduction for adolescents (Vyas, Landry, Schnider, Rojas, & Wood, 2012); thus, boding well for the feasibility and acceptability of using the Internet to promote other positive health practices (physical activity) in Latinas.

Description of the current study: Muévete Alabama

Muévete Alabama was a website and social support-based program to promote physical activity among Latinas. The two primary components of the program were: 1) a previously developed culturally and linguistically adapted physical activity promotion website for Latinas, and 2) social support from an exercise partner selected by the participant.

Cultural and Linguistic Adaptation of the Study Website

The culturally and linguistically adapted, theory-driven website used in the current study to promote physical activity among Latinas, was previously developed through extensive formative research. Specifically, an existing empirically supported physical activity intervention that was developed in mostly White samples was adapted for use with Latinas through a series of formative research (Pekmezi et al., 2012)

In the first stage of culturally and linguistically adapting the intervention, intervention materials and research measures were translated into Spanish using a translation and back-translation process. Next, cognitive interviews (n=25) were then

conducted with Latinas to clarify intervention messages and to ensure that no key content was lost in translation. For example, during these interviews Latinas suggested that the term *rewarding yourself* for meeting physical activity goals referred to material rewards which may not be appropriate for low-income Latinas (Pekmezi et al., 2009) and encouraged researchers to use the phrase "*doing something good for yourself*." Focus groups on physical activity barriers and Internet use and preferences were conducted with Latinas and modifications were made to the website accordingly. Table 1 illustrates themes identified in focus groups and modifications to the website (Pekmezi et al., 2009).

Table 1. *Themes from focus groups and modifications to Intervention.*

Physical Activity Barriers	Intervention Modifications
Literacy	Used qualitative methods and low-literacy strategies to modify measures and materials to better match our sample's educational experience.
Daily Stressors/Negative Mood	Added more information on mood benefits of physical activity and strategies being active when in negative mood (e.g., small goal setting, social support).
Neighborhood Safety	Added safety recommendations (exercise indoors or in well-lit public areas).
Lack of time	Augmented existing content on this topic with examples that are familiar to Latinas (working physical activity around children's and household schedules).
Lack of Motivation	Added language that is familiar to Latinas (e.g., "falta de ganas").
Childcare	Discussed how physical activity can improve child welfare (i.e., increases energy to care for children and sets good example).
Partner Support	Added text from marital therapy field on partner negotiation.

Personal Empowerment	Discussed benefits of self-care to individual and others and how to attend to one's own needs in the face of conflicting demands from others.
Not having Money for fitness	Reframed physical activity to include behaviors that do not require gym membership or special equipment (i.e., walking or dancing).
Inclement Weather	Added text on winter options for physical activity as well as suggestions for appropriate winter clothing.
Gender Roles	Discussed how women get many benefits from regular activity, examples of fit Latina celebrities, and concerns regarding sweating.
Different Body Size Ideals	Emphasized that fitness does not mean "losing your curves."
Appeal/Relevance of Website	Intervention Modifications
Enjoyment of Music	Added music to the website.
Interest in Exercise Videos	Added a library of exercise videos (including Zumba) to website.
Appearance	Streamlined the website text and increased font size. Added more pictures, including pictures of Latinas of varying shapes and sizes.

Theoretical Basis of Intervention

The website was based on constructs of both the Transtheoretical Model (Prochaska & DiClemente, 1983) and Social Cognitive Theory (Bandura, 1986). Past reviews of physical activity interventions with Latinos have shown that the Trantheoretical Model and the Social Cognitive Theory are among the most common behavioral theories utilized for promoting physical activity in the Latino population (Ickes & Sharma, 2012). The Social Cognitive theory was developed by Albert Bandura

in the 1970's (Hayden, 2009) and was previously known as the social learning theory. The Social Cognitive Theory suggests that human behavior results from the interaction between personal, behavioral and environmental influence (Bandura, 1986; National Cancer Institute, 2005), and that altering one of these factors influences all others (Hayden, 2009). Commonly used Social Cognitive Theory constructs in physical activity research include self-efficacy, self-regulation, and observational learning. Self-efficacy, known as both an individual theory and a construct used in other behavioral theories, refers to an individual's belief in their ability to successfully perform a task (Bandura, 1997). Self-regulation refers to influencing individual behavior through self-monitoring, goal setting, feedback, self-rewards, self-instruction, and seeking social support (Bandura, 1997). Observational learning, or modeling, refers to learning to perform a behavior by observing the actions and outcomes of others (National Cancer Institute, 2005).

The Transtheoretical Model was developed by Prochaska and DiClemente in 1983 to understand the process of behavioral change. It suggests behavioral change is a process, rather than a static event, in which people continually move through the five stages of change: Pre-Contemplation, Contemplation, Preparation, Action and Maintenance. It suggests that progression through the stages of change can be circular, whereas individuals can either move forward to the next stage or relapse to the previous one (DiClemente et al., 1991). In addition to the Stages of Change, other key constructs of Transtheoretical Model are Processes of Change, Decisional Balance and Self-Efficacy. Processes of change helps to understand how change occurs and can help to move an individual through the stages of change. Decisional balance refers to weighing

out the pros and cons of a behavior and suggests that the pros should outweigh the con in order for behavior change to occur (DiClemente et al., 1991). Self-efficacy is also a construct of the Social Cognitive Theory and was defined in the previous section. Table 2 illustrates theoretical constructs targeted by the Muévete Alabama intervention.

Table 2. *Theoretical constructs targeted by intervention components.*

Theoretical Construct	Intervention Component to Address Construct
Social Support	• Two pedometers given to each participant (one for self and one for a friend/family member) and encouragement for using with a walking partner • Guest log on given to participant for a friend or family member to access the website • Brochure with information on social support
Outcome Expectations	• Tip sheet on website provides information on benefits of physical activity
Self-Regulation	• Pedometer to monitor steps • Interactive physical activity tracking calendar
Observational Learning	• Exercise videos demonstrating Latinas exercising to Latin music
Stages of Change **Processes of Change** **Self-Efficacy**	• Participants are encouraged to complete questionnaires on website (Stages of Change, Processes of Change questionnaires, Self-Efficacy) and receive a tailored physical activity counseling based on their questionnaire responses.

Study Website Components

The main components of the website are: a) individually tailored feedback reports on physical activity, b) physical activity monitoring and goal setting, and c) exercise videos, physical activity advice and information. The website also provides information on behavioral strategies for increasing activity levels, such as problem-solving barriers,

increasing social support, and rewarding yourself for meeting physical activity goals. Each of these components is briefly described in the following text.

Tailored feedback reports. The email contained the website link, information on how to access the online surveys, and contact information for research staff. Upon completing the surveys, participants immediately receive an online tailored expert system report based on their responses to the survey. These reports included information regarding: 1) current stage of motivational readiness for physical activity; 2) increasing self-efficacy for physical activity; 3) cognitive and behavioral strategies associated with physical activity (processes of change); 4) how the participant compares to individuals who are physically active and with national guidelines for physical activity (normative feedback); 5) useful facts about physical activity, such as health benefits, stretching, and heart rate monitoring. The expert system draws from a bank of over 300 messages addressing different levels of these psychosocial and environmental factors affecting physical activity.

Goal setting and physical activity monitoring tools. The website also included a physical activity goal-setting feature where participants could set weekly physical activity goals (i.e., daily minutes physical activity, types of physical activity, and steps per day). Participants could then track their activity daily on a calendar and view a graph that compared their actual physical activity to their goals.

Exercise videos. The website also includes four videos of Latina women exercising to Latin music, such as salsa, cumbia and bachata.

Physical activity advice and information. Participants could click on website links to access further physical activity information. Information available on the website

includes daily, weekly, and monthly physical activity tips, health benefits of physical activity, ways to make exercise fun, setting realistic goals; and motivating and rewarding yourself for physical activity. Participants were also able to view a sample *Ask the Expert* question and answer panel and *Common physical activity questions* where they could read questions and answers on different physical activity topics. Sample questions included "how can I incorporate physical activity into my daily life?" "Is social support important for maintaining physical activity?" "What do I do if I am too tired to exercise?"

Social Support Components

To promote social support for physical activity in the current study, each study participant received two pedometers, one for herself and one to give to a friend or family member, a guest log on to the study website for friend or family member, and a brochure with information on social support for exercise. The brochure included information on topics such as: what is social support, examples and benefits of social support for physical activity, and tips for maintaining good social support for exercise.

Pedometers and website log on. All study participants received two pedometers and two website log on identification codes. One pedometer and website logon code was for the participant enrolled in the study and the second pedometer and website log on code was for the participants to give to a companion of their choice (i.e., friend, family member and/or co-worker). The purpose of giving each participant an extra pedometer and a guest log on to the website was to encourage social support. Previous physical activity interventions with Latinas have shown success for increasing social support

through exercise or walking partners (Brown et al., 2012; Keller & Cantue, 2008; Marquez & Wing, 2013; Olvera et al., 2010); and have relied on partner selection approaches such as having the participant select an exercise partner from their own social network (Marquez & Wing, 2013), being assigned to or paired-up with another study participant (Keller & Cantue, 2008), or enrolling in a study as friend or family pairs (Brown et al., 2012; Olvera et al., 2010). In the current study, participants were asked to select their own family member, friend or co-worker to wear the pedometer and receive a log on to the website (versus assignment or enrolling with a friend/family member). Allowing the participants to select their own social support partner has previously been shown to have a positive influence on performance of physical activity (Grassi et al., 1999).

Handouts on social support for exercise. A Spanish-language pamphlet with information on social support for exercise was created for this study. Two social support pamphlets were given to each participant, one for the participant and another for the participant's companion. The social support pamphlets provided information about social support for physical activity such as examples and benefits of social support, tips for maintaining good social support and activities to do with others in social network (e.g., plan to get together once a week to go for a walk, go to an exercise class together).

Summary

Latinos are the fastest growing population in the United States and continue to bear a disproportionate burden of physical inactivity and related medical conditions. Previous research has shown that factors such as level of acculturation and social support

may play a role in influencing physical activity behavior in the Latina population. Given the many physical activity barriers and health disparities reported by this group, innovative approaches for delivering culturally appropriate physical activity interventions are necessary. Past physical activity promotion interventions have shown support for the use of Internet-based interventions with primarily non-Latino populations; however, published literature on web-based physical activity interventions specifically for Latinas remains scarce. The current web-based intervention study provided insight into an innovative approach for promoting physical activity with Latinas and will help to fill the gap in literature in this area.

CHAPTER 3

METHODS

Introduction

The purpose of this study was to evaluate self-reported changes in physical activity and social support, and to examine the relationship between physical activity and acculturation following a one-month Internet-based physical activity intervention. This chapter will describe data collection and analysis methods used in the current study.

Study Design

This pilot study evaluated the acceptability and feasibility of a culturally and linguistically adapted interactive Web-based intervention promoting physical activity among Latinas in Alabama (*Muévete Alabama).* A one-month, single group, pre- post-test design was used to examine the outcomes of physical activity, social support, and acculturation in Latina adults. The study consisted of three visits: (1) orientation session, (2) baseline assessment, and (3) one-month assessment. Acculturation was assessed only at the orientation session; physical activity and social support were assessed at both baseline and one-month follow-up.

Participants

The study population (n=24) was comprised of self-identified Spanish-speaking Latinas in Alabama. Eligibility criteria for study enrollment included: a) aged 19-65 years, b) insufficiently active at baseline assessment (defined as ≤ 30 minutes of physical activity/day during ≤ 2 days/week), c) self-identified Spanish speaking Hispanic or Latina, d) had access to the Internet either at home, work or through a friend/family member, and e) no history of any medical condition that would prevent participation in physical activity or could worsen with changes in physical activity. Exclusion criteria included: a) current pregnancy or planning to become pregnant within 2 months, b) Body Mass Index (BMI) over 40, c) current participation in any other physical activity promotion or related program, d) history of heart disease, stroke or any other health condition that would make physical activity unsafe, and e) hospitalization for a psychiatric disorder within the previous 3 years.

Procedure

Participants were recruited from the Birmingham metro area during the fall of 2013. A variety of recruitment strategies were used, including: distribution of study flyers, word-of-mouth, and face-to-face recruitment by Spanish-speaking staff through local community organizations (i.e., non-profit organizations for Hispanic families and individuals, churches, and public library). To establish trust within the Latino community, gatekeepers of local organizations (non-profit organizations, churches) were contacted prior to recruitment and were given thorough information about the study, contact information for study staff, and study flyers to distribute within their

organizations. Study flyers were also distributed at a public library and given to an English as a Second Language (ESL) instructor at that library to distribute in class. In-person recruitment by Spanish-speaking research staff members was also conducted at multiple locations to inform potential participants of the study and distribute study flyers. Once flyers were distributed at community locations, interested participants called a bilingual/bicultural research staff member, and after an in-depth explanation about the study, they completed an eligibility-screening interview.

The Physical Activity Readiness Questionnaire, an exercise readiness tool that is recommended by the American College of Sports Medicine to assess risk from physical activity participation (American College of Sports Medicine, 2005), was used as part of this telephone screening to assess risk for physical activity. The Physical Activity Readiness Questionnaire is a self-reported questionnaire that includes questions regarding exercise risk factors such as high blood pressure, family history of heart disease, and obesity (American College of Sports Medicine, 2005). Women who reported the presence of any of the above risk factors were excluded from participation in the current study.

After eligibility was established, interested participants were scheduled to attend the orientation session. At the orientation session participants viewed a Spanish-language Power Point presentation with information about the study and had the opportunity to ask questions and to complete the informed consent process. Once participants signed the informed consent, they completed demographic and acculturation questionnaires, had measurements of height and weight taken, and were given an Actigraph GT3X+ activity monitor to wear for the next seven days until their baseline assessment. Detailed verbal and written instructions were given on how to wear the activity monitors.

At the baseline assessment participants returned the activity monitors, completed questionnaires and the Seven Day Physical Activity Recall. At this visit participants were given a log on identification and password to access the study website during the next month and a demonstration on how to use the website features. During this visit, participants were also encouraged to complete the online questionnaire as soon as possible after their baseline visit and to use the website's exercise log. In addition to their own website access, participants received a guest log on identification and password to give to a friend or family member. Participants also received two pedometers, one for themselves and one to give to a friend/family member of their choice. A Spanish-speaking project staff member provided instructions on how to wear the pedometer, as well as a discussion on increasing social support for exercise by developing social networks that promote physical activity and encouragement to find a friend/family member or walking partner. A pamphlet with information on social support for exercise and a list of local free and low cost resources where they can be physically active (e.g., parks, recreational facilities, etc.) was also provided to participants.

Between the baseline assessment and the one-month assessment participants received one email with reminder information on using the website, as well as phone calls and/or text messages from research staff to confirm assessment appointments. The email(s) provided detailed information on how to use the website features and encouraged them to contact research staff for further website instruction. During this time, participants were also mailed an activity monitor to wear for seven days prior to their one-month assessment. At the one-month assessment participants returned the activity monitor, completed questionnaires and the Seven Day Physical Activity Recall,

and had measurements of height and weight taken. All study activities and materials were delivered in Spanish by a bilingual/bicultural research staff member.

The current study received approval from the University of Alabama at Birmingham Institutional Review Board for Human Use (IRB). Recruitment began in October 2013 and continued until all participants were enrolled in December 2013. Participants were eligible to receive a total of $105 for participation in the study; they received a $35 visa debit card upon completion of each post-orientation visit.

Outcome Measures

All measures were assessed in the Spanish language and have been previously used with Latino populations. The following measures were used to assess study outcomes.

Physical Activity

Physical activity was assessed using the Seven Day Physical Activity Recall (Sallis et al., 1985). The Seven Day Physical Activity Recall is a semi-structured interview that assesses the frequency, duration, and intensity of physical activity. It provides an estimate of minutes per week of physical activity performed in continuous bouts of ten minutes or greater. Previous studies have used a Spanish language version of this measure with Latino populations (Albright et al., 2005; Castaneda et al., 2002; Collins et al., 2004; Keller & Cantue, 2008; Pekmezi et al., 2012; Pekmezi et al., 2009; Poston et al., 2001). The Physical Activity Recall has shown acceptable inter-rater reliability ($r = .78$) with assessments performed on the same subject by different

interviewers (Sallis, Patterson, Buono, & Nader, 1988) and has been validated against doubly labeled water (Washburn, Jacobsen, Sonko, Hill, & Donnelly, 2003) and physical activity logs (Dishman & Steinhardt, 1988).

To corroborate self-reported physical activity findings, participants were instructed to wear an ActiGraph accelerometer, or activity monitor, (GT3X and GT3X+ models) for seven days prior to their baseline and one-month assessments. Accelerometers are small, lightweight devices that measure total frequency, intensity and duration of physical activity (Plasqui & Westerterp, 2007). The ActiGraph device has been validated against doubly labeled water to provide an accurate estimate of physical activity (Plasqui & Westerterp, 2007).

Physical activity data collected via accelerometers were prepared for analysis according to the protocol outlined by Troiano et al. (2008). In order to be considered a valid assessment, participants had to wear the accelerometer for at least 10 hours a day, for 4 or more days during the 7 days coinciding with the Seven Day Physical Activity Recall. The minimal activity count threshold for moderate-to-vigorous physical activity was set at 2020 counts per minute. Data were analyzed and are presented in two ways: a) minutes of moderate-to-vigorous physical activity performed in bouts of ten minutes or greater, and b) total minutes of moderate-to-vigorous physical activity according to the 2020 count per minute threshold. Using ten-minute bouts of moderate-to-vigorous physical activity allows for direct comparison with the Seven Day Physical Activity Recall. The total minutes of moderate-to-vigorous physical activity data are presented for reference only to provide an estimate of overall time spent in moderate-to-vigorous physical activity.

The Seven Day Physical Activity Recall was selected as the primary measure of physical activity in the current study, as opposed to a more objective measure such as an activity monitor, to prevent incomplete or loss of data. For example, in order to obtain a valid estimate of physical activity, participants must wear the accelerometer for a specified amount of time (e.g., five out of the 7 days for 8 hours per day). If they fail to meet the minimum established wearing time, or wear the device incorrectly, then physical activity data may not be available. The Seven Day Physical Activity Recall also provides valuable information on the type of activity performed (e.g., dancing, housecleaning, walking to work), which can help to inform future intervention efforts.

Social Support

Social support for physical activity was assessed using the Social Support for Exercise Scale (Sallis et al., 1987). The Social Support for Exercise is a 10-item scale that measures social support from friends and from family, as two separate outcomes, using a five-point Likert-type scale. A sample item on the questionnaire states "during the past three months, [family/friends] offered to exercise with me." Participants answer each item twice- once as it corresponds to family and once as it corresponds to friends, using a 1-5 scale to indicate level of support. The Social Support for Exercise has shown acceptable test-retest reliability (.79 and .77 for the family and friends scales respectively, $p < .0001$) and internal consistency (Cronbach alpha coefficients = .84 and .91 for friends and family scales, respectively) (Sallis et al., 1987).

Acculturation

The Short Acculturation Scale for Hispanics (Marín et al., 1987) was used to measure acculturation at baseline. The Short Acculturation Scale for Hispanics is a 12-item scale that was developed to measure acculturation among Hispanic individuals; it is available both in English and Spanish. The 12 items on the scale assess different dimensions of acculturation (such as language, media use, and social networks). Sample questions include "What language(s) do you usually speak at home" and "In what language(s) are the T.V. programs you usually watch?" with five-point Likert-type scales to indicate a range from "only English" to "only Spanish." The Short Acculturation Scale for Hispanics indicates good internal consistency (Cronbach alpha = .92) and validity, demonstrating a correlation between acculturation score and participants' generation (r = .65) comparable to other measures of acculturation (Marín et al., 1987).

Demographic Information

Demographic information (age, education, income, children living in home, marital status, native country) was collected at baseline. Measurements of height and weight were taken at baseline and one-month assessment.

Statistical Analyses

Statistical analyses are described below for each of the specific aims. Statistical significance was set at $p \leq .05$. All analyses were conducted using Statistical Packages for Social Sciences (SPSS) version 22.

Specific Aim 1

Aim. *Assess self-reported changes in physical activity, as measured by the Seven Day Physical Activity Recall (Sallis et al., 1985), from baseline to one-month assessment.*

Data Analysis. A paired t-test was used to assess changes in physical activity from baseline to one-month follow-up. Preliminary data analyses indicated that mean changes in physical activity did not meet the assumptions of normality; therefore, a Wilcoxon signed-rank test was performed. The Wilcoxon signed rank test is the non-parametric alternative for the paired t-test and is intended for use with repeated measures (Pallant, 2007).

Specific Aim 2

Aim. *Assess self-reported changes in social support, as measured by the Social Support for Exercise Scale (Sallis, Grossman, Pinski, Patterson, & Nader, 1987), from baseline to one-month assessment.*

Data Analysis. Similarly to the analysis plan for Research Question 1, a paired t-test was used to assess changes in social support from baseline to one-month follow-up. A Wilcoxon signed rank test was performed, as changes in social support data did not meet assumptions of normality.

Specific Aim 3

Aim. *Evaluate whether changes in social support from baseline to one-month assessment were associated with changes in physical activity.*

Data Analysis. Bivariate regression analysis was used to assess whether changes in social support from baseline to one-month follow-up was associated with changes in physical activity. The predictor variable was social support and the dependent variable was self-reported physical activity. Bivariate regression analyses were selected due to the small sample size in the proposed study; thus limiting the ability to include multiple independent variables into regression models due to power concerns.

Specific Aim 4

Aim. *Examine if baseline levels of acculturation, as measured by the Short Acculturation Scale for Hispanics (Marín, Sabogal, VanOss Marin, Otero-Sabogal, & Perez-Stable, 1987), were associated with changes in physical activity from baseline to one-month assessment.*

Analysis plan. Bivariate regression analysis was used to assess whether baseline levels of acculturation were associated with changes in physical activity from baseline to the one-month follow-up. The predictor variable was acculturation and the dependent variable was change in self-reported physical activity from baseline to the one-month follow-up.

Missing Data

Data was analyzed by intention-to-treat. Missing data at the one-month follow-up assessment was accounted for using the intent-to-treat analysis. In the case of missing data points at follow-up (i.e., due to participant attrition), baseline data was carried forward for missing values at one-month. This was a conservative approach to handling missing data as it assumes that there was no change between baseline and one-month assessment periods. In the current study three participants had missing data at one-month. Data analyses were conducted both for study completers and for participants with baseline data carried forward to the one-month assessment.

Summary

A primary data analysis of a one-month, single group pre- post-test design study was performed. The sample consisted of 24 Latina adults between the ages of 21-61 years. Paired t-tests and bivariate regression models were used to evaluate the intervention's impact on physical activity and social support, and the relationship between acculturation and changes in physical activity.

CHAPTER 4

RESULTS

Introduction

The purpose of the study was to evaluate the physical activity, acculturation and social support outcomes of a one-month, theory-driven (Social Cognitive Theory and Transtheoretical Model) culturally and linguistically adapted Internet-based physical activity intervention for Latinas. The results of the study are presented in this chapter.

Participants

Sample Characteristics

Forty six-participants were screened for the study. Thirty-three were eligible to participate. Among the thirteen participants who were ineligible to participate, reasons for ineligibility included: no Internet access, already physically active (currently engaging in over 60 minutes of moderate intensity physical activity per week), and lack of interest in the study. Enrollment in the study was defined as signing informed consent form and attending the baseline visit. Twenty-five participants enrolled in the study; one was excluded from all analyses as her BMI exceeded eligibility criteria (BMI >40) when weighed at the orientation session. This eligibility criterion was selected for the current study as a BMI of 40 or above indicates extreme obesity (Weight Control Information

Network, 2013); individuals with extreme obesity may have a greater risk for adverse events when performing physical activity and may be better suited for a supervised exercise program. Twenty-four participants completed the baseline assessment and 21 completed the one-month follow-up, indicating a study retention rate of 87.5 percent. Figure 1 illustrates the participant recruitment and retention flow diagram.

Participants were Latina females between the ages of 21-61 years (M=35.17, SD=11.22). Most of the women (83.3%) were born outside of the continental United States. The majority of participants reported being Mexican or Mexican-American (n= 15, 62.5%) and having less than a high school education (n=10, 41.7%). Three participants reported graduating from high school (12.5%), four reported attending technical school (n=4, 16.7%) or some college (n=2, 8.3%), and five (20.9%) had completed a college degree or higher. Most of the women were either married (n=10, 41.7%) or living with a partner (n=6, 25.0%), and approximately half (n= 12, 48%) were employed. Table 3 illustrates complete demographic characteristics of participants.

Figure 1. Participant recruitment and retention flow diagram.

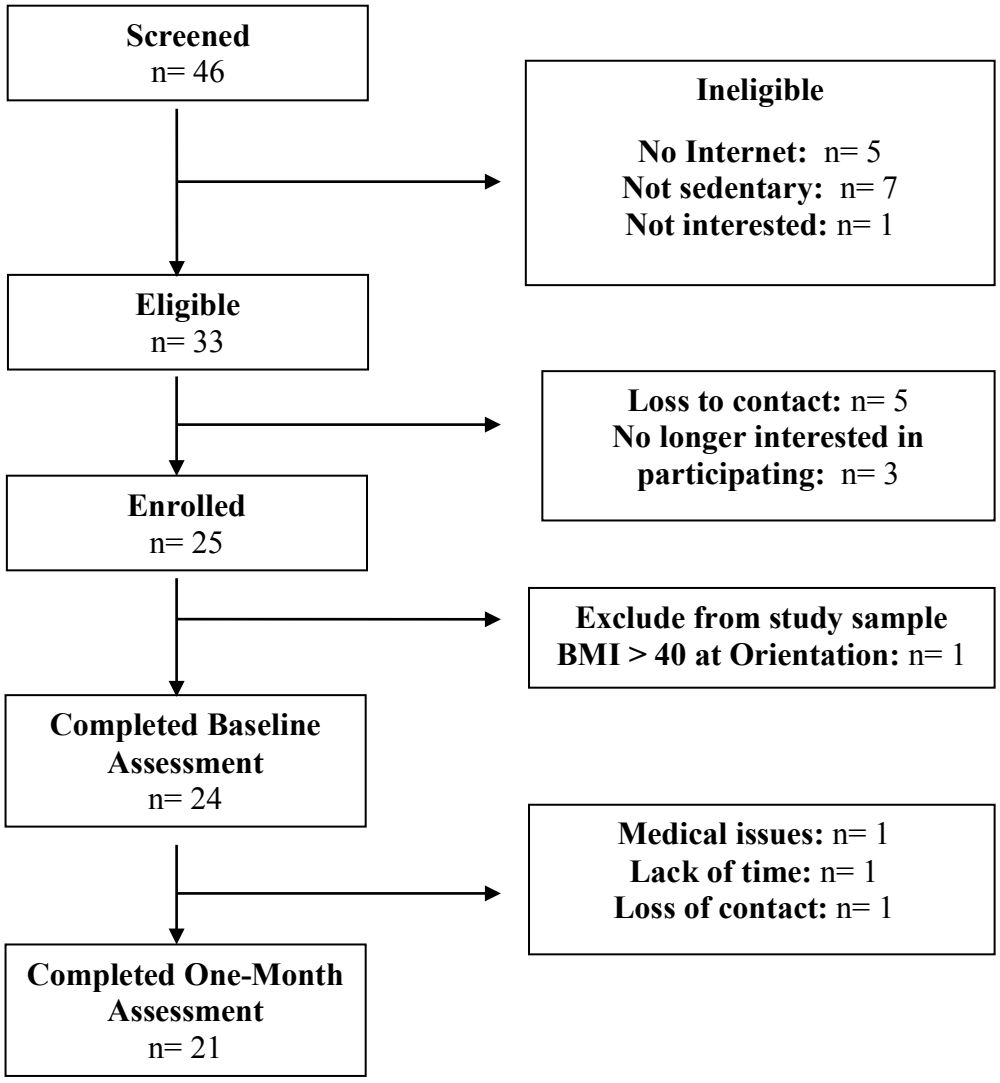


Table 3. *Demographic characteristics of participants at baseline (N=24).*

	Mean	SD
Age	35.17	11.22
	N	**Percentage**
Characteristic		
Latino/Hispanic, female	24	100
Foreign born		
Yes	20	83.3
No	3	12.5
No Answer	1	4.2
Educational level		
Less than 12 years	10	41.7
High school graduate	3	12.5
Technical school	4	16.7
Some college	2	8.3
College graduate	4	16.7
Post-graduate	1	4.2
Employment		
Unemployed	12	50.0

	N	Percentage
Part-time (less than 35 hours weekly)	4	16.7
Full-time (35 hours or more weekly)	8	33.3
Yearly household income		
<$10,000	4	16.7
≥$10,000 but <$20,000	5	20.8
≥$20,000 but <$30,000	3	12.5
≥$30,000 but <$40,000	5	20.8
≥$40,000 but <$50,000	2	8.3
>$50,000	2	8.3
Marital status		
Never married nor living with partner	2	8.3
Living with partner	6	25.0
Married	10	41.7

	N	Percentage
Divorced	4	16.7
Separated	1	4.2
Widowed	1	4.2
Children aged 6-18 years living with you		
Yes	13	54.2
No	11	45.8
Children ages ≤ 5 living with you		
Yes	12	50
No	12	50

Completers versus Non-Completers

Study completers were defined as participants who completed the baseline and one-month assessments. Results for all research questions are provided for study completers and using intent-to-treat analysis for participants with missing data at one-month. Twenty-one participants completed all study assessments and three missed the one-month assessment.

Corroboration of Seven Day Physical Activity Recall Data with Accelerometer Measured Physical Activity

Correlation analyses between the Seven Day Physical Activity Recall data and physical activity assessed by accelerometers are presented in Table 4. At baseline, 18 participants provided valid accelerometer data (wore accelerometer at least 10 hours a day for 4 or more days during assessment period) but there were no significant correlations between the Seven Day Physical Activity Recall and both accelerometer measured physical activity outcomes (rho = -.386, p=.114 for moderate-to-vigorous physical activity performed in bouts of ten minutes or greater; rho = -.015, p=.953 for total minutes of moderate-to-vigorous physical activity).

At the one follow-up assessment, 11 participants provided valid accelerometer data. Once again, correlations between self-reported physical activity and accelerometer measured physical activity were not significant (rho = .347, p=.224 for moderate-to-vigorous physical activity performed in bouts of ten minutes or greater; rho = .289, p=.316 for total minutes of moderate-to-vigorous physical activity).

Table 4. *Correlations between self-reported and accelerometer measured physical activity.*

Baseline (N=18)			
	1	2	3
1. Seven Day Physical Activity Recall	1.00	-.386	-.015
2. Accelerometer 10 minute Activity Bouts	-	1.00	.399
3. Accelerometer Total Minutes of Activity	-	-	1.00
One Month (N=14)			
	1	2	3
1. Seven Day Physical Activity Recall	1.00	.347	.289
2. Accelerometer 10 minute Activity Bouts	-	1.00	.520
3. Accelerometer Total Minutes of Activity	-	-	1.00

Notes: Correlations are Spearman's *rho.* No correlations were significant at the $p<.05$ level.

Reliability Estimates of Acculturation and Social Support Scales

Inter-item reliability estimates for the Short Acculturation Scale for Hispanics at baseline and the Social Support for Exercise Scale at baseline and one-month follow-up are presented in table 5. Both scales showed good reliability estimates.

Table 5. *Inter-item reliability estimates for acculturation and social support scales for all assessment periods.*

Variable	Range	Number of Items	Baseline α	One-Month α
Acculturation	1-5	11[a]	.89	
Social Support from Family	1-5	10	.80	.82
Social Support from Friends	1-5	10	.91	.92

Note: Alpha's presented are Cronbach's alpha coefficients.
[a]Short Acculturation Scale for Hispanics has 12 items. Cronbach's alpha is reported on 11 items as one item had zero variance and was removed.

Specific Aim 1

Aim 1. *Assess self-reported changes in physical activity, as measured by the Seven Day Physical Activity Recall (Sallis et al., 1985), from baseline to one-month assessment.*

Preliminary Analyses

Preliminary analyses indicated non-normality of data. To assess changes in physical activity from baseline to one-month follow-up the Wilcoxon signed rank test was used as the non-parametric alternative to paired t-test analysis. Results are reported below using both t-tests and Wilcoxon signed rank test.

Paired T-test Analyses

A paired t-test was conducted to assess changes in physical activity as measured by the Seven Day Physical Activity Recall from baseline to the one-month follow-up. Study completers (n=21) showed a statistically significant increase in physical activity from baseline (M= 29.05, SD= 34.01) to one-month follow-up (M= 125.48, SD= 148.22), t= 3.32, p= .003. The mean increase in physical activity was 96.43 minutes per week.

Baseline observations were carried forward for participants with missing data at the one-month follow-up. Intent-to-treat analysis showed a mean increase in physical activity of 84.38 minutes per week (n=24, t= 3.22, p= .004) from baseline to one-month. Table 6 shows mean physical activity levels at baseline and one-month assessments for study completers and intent-to-treat.

Table 6. *Mean self-reported physical activity levels at baseline and one-month.*

	Baseline Mean (SD)	One- Month Mean (SD)	Mean Difference	t	p-value
Completers (N=21)	29.05 (34.01)	125.48 (148.22)	96.43	32	.003
Intent-to-treat (N=24)	28.54 (33.38)	112.92 (142.7)	84.38	22	.004

Wilcoxon Signed Rank Test

Complete case analysis indicated a statistically significant increase in physical activity from baseline to the one-month assessment (z= -3.36, p= .001). Between the

baseline and one-month assessments, median physical activity increased from 12.5 minutes per week to 75 minutes per week.

Intent-to-treat analysis also showed a statistically significant increase in physical activity from baseline to the one-month assessment (z= -3.36, p= .001). Between the baseline and one-month assessments, median physical activity increased from 12.5 minutes per week to 67.5 minutes per week. Table 7 shows median changes in physical activity.

Table 7. *Median changes in self-reported physical activity.*

	Median (range)		Median Change	
	Baseline	One-Month	Baseline to One- Month *z*	*p**
Intent-to-treat (N=24)	12.5 (0 -120.0)	67.5 (0 – 510.0)	-3.36	.001
Completers (N=21)	12.5 (0 – 120.0)	75.0 (0 – 510.0)	-3.36	.001

Note: *P-values based on Wilcoxon signed rank tests.

Accelerometer Measured Physical Activity Outcomes

Data were analyzed and are presented in two ways: a) minutes of moderate-to-vigorous physical activity performed in bouts of ten minutes or greater and b) total minutes of moderate-to-vigorous physical activity. Total minutes of moderate-to-vigorous physical activity are provided solely for reference, as this outcome does not coincide with the physical activity outcomes assessed by the Seven Day Physical Activity

Recall (i.e., The Seven Day Physical Activity Recall only assesses physical activity performed in bouts of 10 minutes or greater).

Among the 18 participants that provided valid accelerometer data at baseline, only two participants engaged in bouts of physical activity for a duration of 10 minutes or greater. The total minutes per week of moderate-to-vigorous physical activity for each of these participants was 23 and 26 minutes, respectively. Data for the remaining 16 participants showed no engagement in moderate-to-vigorous physical activity performed in a bout of ten minutes or greater.

At the one-month follow-up assessment, 14 participants provided valid accelerometer data. Analyses revealed that only four participants engaged in at least one ten-minute bout of physical activity. The median minutes per week of physical activity for these four participants was 24.5 (*SD*=14.5, Range 12.5 to 45). The remaining 10 participants did not engage in a bout of ten minutes or greater of at least moderate intensity physical activity.

A Wilcoxon signed rank test was used to evaluate pre-post intervention changes in moderate-to-vigorous physical activity (MVPA). Results showed null physical activity outcomes among participants (N=11) with valid accelerometer data at both the baseline and one-month follow-up (Wilcoxon z=-.365, p=.715 for changes in physical activity according to 10 minutes bouts; Wilcoxon z=-.089, p=.929 for change in total moderate-to-vigorous physical activity). Outcomes for accelerometer measured physical activity are presented in Table 8.

Table 8. *Accelerometer measured physical activity outcomes (N=11).*

	Median (Range)		Baseline to One-Month Change	
	Baseline	One-Month	*z*	*p*
MVPA performed in 10 minutes bouts (minutes)[a]	0 (0 – 26.0)	0 (0 – 45.0)	-.365	.715
Total MVPA (minutes)	0 (25.0 – 186.0)	0 (13.0 – 207.5)	-.089	.929

Note: [a] Medians and range values for MVPA performed in 10 minute bouts are based on data from 2 participants at baseline and 4 participants at one-month.

Specific Aim 2

Specific Aim 2

Aim. *Assess self-reported changes in social support, as measured by the Social Support for Exercise Scale (Sallis et al., 1987), from baseline to one-month assessment.*

Preliminary Analyses

Similarly to Aim 1, t-tests were used to evaluate changes in social support from baseline to the one-month follow-up using the Social Support for Exercise Scale, which measures the two separate outcomes of social support from family and social support from friends. The Wilcoxon signed rank test was used as the non-parametric alternative to paired t-test analysis, as social support data did not meet assumptions of normality in preliminary data analyses. Results are reported below using both t-tests and Wilcoxon signed rank test.

Paired T-test Analyses: Social Support from Family

Study completers (n=21) demonstrated an increasing trend (mean increase= .22, SD= .79) in social support from family from baseline to the one-month assessment; however, no statistically significant change was found in family social support from baseline to one-month (t= 1.30, p= .21). For participants missing data at the one-month follow-up, intent-to-treat analysis indicated that participants (n= 24) reported a mean increase in social support of .20 (SD= .74). No statistically significant changes in social support from family were found (t= 1.30, p= .21).

Paired T-test Analyses: Social Support from Friends

One participant was missing baseline and one-month data for social support from friends and was excluded from this analysis. Study completers (n=21) reported a mean increase of .18 (SD= .92) in social support from friends from baseline to the one-month assessment; however, this increase was not statistically significant (t= .91, p= .38). Using intent-to-treat analysis, participants (n= 23) reported a mean increase in social support from friends of .17 (SD= .88). No statistically significant changes in social support from friends were found (t= .91, p= .38). Table 9 illustrates mean social support from family and social support from friends at baseline and one-month assessment.

Table 9. *Mean social support from family and social support from friends at baseline and one-month.*

	Baseline Mean (SD)	One-Month (Mean SD)	Mean Difference (SD)	t	p-value
Social Support from Family					
Completers (N=21)	1.60 (.59)	1.82 (.66)	.22 (.79)	1.30	.21
Intent-to-treat (N=24)	1.62 (.56)	1.82 (.62)	.20 (.74)	1.30	.21
Social Support from Friends					
Completers (N=21)	1.45 (.61)	1.63 (.78)	.18 (.92)	.91	.38
Intent-to-treat (N=23)	1.46 (.60)	1.62 (.77)	.17 (.88)	.91	.38

Note: One participant was excluded from analysis on social support from friends due to incomplete baseline and one-month data on this item.

Wilcoxon Signed Rank Test: Social Support from Family

No statistically significant changes in social support from family were found (z= -1.71, p= .087) among study completers (n=21) between baseline and the one-month assessment. Intent-to-treat analysis revealed similar non-significant findings, see table 10 for findings.

Wilcoxon Signed Rank Test: Social Support from Friends

One participant was missing baseline and one-month data for social support from friends and was excluded from this analysis. No statistically significant change in social support from friends among study completers (n=21) from baseline to one-month was found (z= -1.22, p= .221) using the Wilcoxon signed rank test. Intent-to-treat analysis revealed similar non-significant findings participants missing one-month data. Table 10 illustrates median social support from family and social from friends at baseline and one-month assessment.

Table 10. *Median social support from friends and family at baseline and one-month.*

	Median			
	Baseline	One-month	*z*	*p**
Social Support from Family				
Intent-to-treat (N=24)	1.50 (1-2.8)	1.65 (1– 3.1)	-1.71	.087
Completers (N=21)	1.50 (1– 2.8)	1.60 (1– 3.1)	-1.71	.087
Social Support from Friends				
Intent-to-treat (N=23)	1.20 (1-3.5)	1.50 (1-3.8)	-1.22	.221
Completers (N=21)	1.20 (1-3.5)	1.50 (1-3.8)	-1.22	.221

Note: *P-values based on Wilcoxon signed rank tests.

Specific Aim 3

Aim 3. *Evaluate whether changes in social support from baseline to one-month assessment were associated with changes in physical activity.*

Bivariate regression analysis was used to assess whether changes in social support from baseline to the one-month follow-up were associated with changes in physical activity. Social support for exercise was examined as two separate outcomes 1) social support from family and 2) social support from friends.

Social Support from Family

Regression analysis for study completers (n=21) showed that there was no significant association between changes in social support from family and changes in physical activity among study completers ($\beta = .14$, $R^2 = .02$, $p = .55$). Intention-to-treat analysis also showed that there was not a significant association between baseline to one-month changes in self-reported physical activity and changes in social support from family ($\beta = .16$, $R^2 = .03$, $p = .46$).

Social Support from Friends

Regression analysis for study completers (n=21) also showed that there was not a significant association between changes in social support from friends and changes in physical activity among study completers ($\beta = .38$, $R^2 = .14$, $p = .10$). One participant was missing data for social support from friends at baseline and one-month follow-up and was excluded from this regression analysis. Bivariate regression outcomes of changes in

social support and changes in physical activity from baseline to one-month for study completers are reported table 11.

Intention to treat analysis also showed that there was not a significant association between baseline to one-month changes in self-reported physical activity and changes in social support from family (β=. 35, R^2= .12, p= .10). Bivariate regression outcomes are reported in table 12 for changes in social support and changes in physical activity from baseline to one-month using intent-to-treat analysis for participants with missing observations at one-month.

Specific Aim 4

Aim 4. *Examine if baseline levels of acculturation, as measured by the Short Acculturation Scale for Hispanics (Marín, Sabogal, VanOss Marin, Otero-Sabogal, & Perez-Stable, 1987), were associated with changes in physical activity from baseline to one-month assessment.*

Bivariate Regression Analyses

Bivariate regression analysis showed that there was no significant relationship between baseline level of acculturation and changes in self-reported physical activity from baseline to the one-month follow-up (β= -.29, R^2= .08, p= .20).

Baseline physical activity data was carried forward from baseline to one-month for participants missing data at the one-month assessment. Intent-to-treat analysis indicated that there was no significant relationship between acculturation measured at baseline and changes in physical activity between baseline and the one-month follow-up

(β= -.23, R^2= .05, p= .29). Bivariate regression outcomes for acculturation and pre-post changes in physical activity are reported in table 11.

Table 11. *Bivariate regression outcomes between study variables and pre-post intervention changes in physical activity.*

Variable	df	F	Beta	R^2	p-value
Acculturation	*20*	1.73	-.29	.08	.20
Pre-Post Changes in Social Support for Exercise					
Family	20	.37	.14	.02	.55
Friends	19	3.00	.38	.14	.10

Table 12. *Bivariate regression outcomes between study variables and pre-post changes in physical activity using intent-to-treat values.*

Variable	df	F	Beta	R^2	p-value
Acculturation	23	1.20	-.23	.05	.29
Pre-Post Changes in Social Support for Exercise					
Family	23	.57	.16	.03	.46
Friends	22	2.95	.35	.12	.10

Note: Pre-post intervention changes in social support and physical activity carried baseline data for participants with missing observations at one-month.

Summary

The purpose of the study was to evaluate physical activity and social support outcomes of a one-month, theory-driven, culturally and linguistically adapted Internet-based physical activity intervention for Latinas and to examine the association between acculturation and physical activity changes among study participants. At baseline, participants were self-reported Latinas between the ages of 21-61 years (M=35.17, SD=11.22). Study completers reported significant increases in moderate-to-vigorous physical activity from an average of 29.05 (SD= 34.01) minutes per week at baseline to 125.48 (SD= 148.22) minutes per week at one month (p= .003). Non-parametric tests and intent-to-treat analyses indicated similar results. There were no significant changes in social support from baseline to one-month and no significant association between pre-post changes in social support and pre-post changes in physical activity. Baseline level of acculturation was not significantly associated with pre-post changes in physical activity.

CHAPTER 5

DISCUSSIONS, CONCLUSIONS, AND PUBLIC HEALTH IMPLICATIONS

Introduction

Intervening to promote physical activity and reduce the disproportionate levels of related health conditions among Latinas requires the use of innovative approaches that can reach large numbers of individuals and can help to overcome many of the common barriers of face-to-face physical activity interventions. Latinos are the fastest growing minority population in the United States and come from diverse cultural and linguistic backgrounds. Interventions to promote physical activity in this population should address the unique factors that influence performance in physical activity, such as fear of immigration authorities, language barriers, perceptions about physical activity and lack of social support. Previous interventions promoting physical activity among Latinas have relied on face-to-face interventions or print strategies; however, there is a paucity of published literature on Internet-based interventions exclusively targeting Latinas.

With the rapid growth in Internet access among Latinos in recent years, Internet-based interventions may be a feasible approach for delivering physical activity promotion interventions in this population. Internet-based interventions can help to overcome barriers of face-to-face interventions and have the potential to reach a large number of individuals at a relatively low cost. The purpose of the current study was to assess acculturation, physical activity and social support outcomes following a one-month

culturally and linguistically adapted physical activity intervention for underactive Spanish-speaking Latina adults ages 19-65. Latina adults were targeted due to the disproportionate level of physical activity and physical activity-related health disparities. Rapidly increasing Internet access in this population supports the need to learn about the use of Internet technologies for promoting physical activity within this population. Furthermore, the study website was previously developed through a series of formative research to address the unique cultural factors that influence physical activity in this group. If Internet-based interventions can successfully promote physical activity with Latina adults, the use of web-based technologies could provide an innovative approach for reducing physical activity and related health disparities in the Latino community.

Summary of Findings

The current study evaluated changes in physical activity and social support from baseline to the one month-assessment, and the association of acculturation and changes in physical activity in a one-month, single-arm pre-post test design study of a culturally and linguistically adapted Internet-based physical activity intervention. The study targeted underactive (defined as performing 60 minutes or less moderate-to-vigorous physical activity per week) Spanish-speaking Latina adults ages 19-65 in the Birmingham, Alabama area. All participants (N=24, 100%) were self-reported Hispanic/Latino females. Most of the women were born outside of the United States (83.3%) and had a mean age of 35.17 (SD 11.22) years.

The first aim of the study was to assess changes in physical activity from baseline to one-month follow-up using the self-reported measure of Seven-Day Physical Activity

Recall. Participants reported a significant increase in physical activity from 29.05 (SD= 34.01) minutes per week at baseline to 125.48 (SD= 148.22) minutes per week at baseline the one-month. Intent-to-treat analyses and non-parametric tests also indicated a significant increase in physical activity. To corroborate self-reported physical activity levels, participants wore accelerometers for the same seven-day period assessed by the Seven Day Physical Activity recall. Results showed a non-significant correlation (rho = -.386, p=.114 for moderate-to-vigorous physical activity performed in bouts of ten minutes or greater) between self-reported and accelerometer measured physical activity. Comparison of physical activity levels between the two measures indicated that participants over reported their physical activity levels at both assessment periods on the Seven Day Physical Activity Recall assessment. While over-reporting of physical activity is commonly reported in the literature, findings from the current study emphasize the need to further explore strategies to correct for over self-reporting of physical activity.

The second aim of the study was to evaluate changes in social support from baseline to the one-month assessment as measured by the Social Support for Exercise Scale. The Social Support for Exercise Scale measures social support from family and social support from friends as two separate outcomes. No significant changes in social support from family or social support from friends were observed from baseline to the one-month assessment using t-tests or the Wilcoxon signed rank test. Perhaps the intervention strategies used to increase social support (recommendations for selection of exercise partner, social support handouts, guest website log on and extra pedometer) in the current study were not comprehensive enough to produce a significant increase in social support over a short period of time. Future studies should examine whether the use

of more intensive strategies, provided over longer term interventions, are more effective in increasing social support in Latina adults.

The purpose of aim three was to evaluate whether changes in social support from baseline to one-month were associated with changes in physical activity. No significant associations were found between changes in social support from family or friends and self-reported physical activity from baseline to one-month. This finding was not surprising given social support did not significantly increase over the duration of the one month study.

The purpose of aim four was to assess whether baseline level of acculturation was associated with changes in physical activity between baseline and one-month. Bivariate regression analyses were performed and no significant associations were found for either study completers or intent-to-treat analyses. A potential explanation for this finding could be due to the homogeneity of acculturation scores in this sample. For example, the majority of our participants reported low levels of acculturation (mean= 2.28, SD= .62). According the Short Acculturation Scale for Hispanics (Marín et al., 1987), a score of 2.99 or less indicates a lower level of acculturation, while 3.0 or higher is indicative of higher acculturation. In the current study, only two participants met the criteria for higher levels of acculturation as defined by Marín et al. (1987) and indicated a relatively small range in scores (range= 2.67). To further understand the relationship between acculturation and physical activity, future studies should include larger and more diverse samples of Latinas in which a greater range of acculturation scores can be found.

Discussion and Conclusions

To the author's knowledge, this study represents one of the first culturally and linguistically adapted Internet-based physical activity promotion interventions to exclusively target Latina adults. Findings from this study are important because Latinos demonstrate disproportionately high levels of underactive lifestyles and physical activity-related health conditions compared non-Hispanic Whites. Latinos come from a broad range of cultural and ethnic backgrounds and report unique factors that play a role influencing performance of physical activity. Thus, there is great need for innovative approaches to intervene and reduce these health disparities in the fastest growing minority population in the United States. Strategies for reducing physical activity related health disparities among Latinas should address the unique cultural and linguistic factors influencing behavior in this population. In the current study, recruitment strategies involved developing a partnership and collaboration between bilingual research staff and leaders/gatekeepers at local Hispanic serving community organizations. The purpose of reaching out to community organizations was not only to facilitate recruitment efforts but also to promote a sense of trust between the Latino community and research staff members. Leaders and gatekeepers of community organizations as well as Latino community members embraced the study and expressed overwhelming interest in learning ways of becoming more physically active and improving their health and the health of their families. In fact, a number of organizations invited research staff to attend the organization to speak about the study and to recruit participants. For example, directors of the Hispanic Ministry at one church were interested in learning more about the study as a means of promoting healthy behavior among their parishioners. They

invited a research staff member to make an announcement about the study at the end of a Spanish-language church service and to recruit participants following the service. At another community organization for Latinos, a program coordinator contacted research staff after seeing one of the study flyers to learn more about the study. She then invited research staff to attend group meetings for Latina adults to provide further information about the study and recruit participants on numerous different occasions. Participants and agency staff at this location were receptive to the study and openly welcomed research staff into the organization to promote the study. Moreover, the program coordinator and several other participants expressed a keen interest in learning ways to continue improving their health and becoming more physically active upon completion of the study.

The establishment of a sense of trust and development of a partnership with Hispanic-serving community organizations, as demonstrated by successful participant recruitment and enrollment in the current study, and high participant retention rate (87.5%), provide support for the feasibility of Internet-based approaches for promoting physical activity Latinas. Findings from this study can contribute to the development of future web-based interventions in this population. Since no Internet-based physical activity interventions targeting exclusively Latina adults were identified in a literature search for the current study, it is not possible to compare findings with other culturally and linguistically adapted Internet-based interventions for promoting physical activity in Latina adults. Results of the current study will be discussed in the context of other web-based studies that included Latinos in their samples (but did not target Latino

populations), and in-person, phone-based or print physical activity promotion interventions with Latina adults.

Comparison of Previous Physical Activity Interventions with Latinas

Although no published studies were found that reported physical activity outcomes of Internet-based interventions for Latinas, a few previous Internet-based physical activity interventions have included notable samples of Latinos adults in their study (Lachausse, 2012; Magoc et al., 2011). Results from the current study are similar to Magoc and colleagues findings of significant increases in self-reported physical activity following the intervention. Magoc et al.'s study does, however, differ form our study in that it targeted a population of college students, did not report using a culturally and linguistically adapted intervention, or use of an objective measure of physical activity. The Internet-based intervention used in our study was culturally and linguistically adapted specifically for Latinas through a series of formative research, thus making it potentially more relevant to Latinas than an intervention used with college students.

The increases in self-reported physical activity found in the current study are consistent with findings from previous physical activity interventions with Latinas that have relied on the use of self-reported measurement of physical activity (Albright et al., 2005; Leeman-Castillo et al., 2010; Lorig et al., 2005; Staten et al., 2005; Pekmezi et al., 2009; Toobert et al., 2011). Although increase in self-reported physical activity in our study did not correlate with accelerometer measured physical activity, the use of both objective and subjective measures contributes to limited literature on objective measures

of physical activity with Latinas and suggests that further investigation is necessary to understand these differences across measures of physical activity.

The lack of correlation between self-reported physical activity and accelerometer-measured physical activity in the current study may be explained by potential interviewer bias; that participants were not accurate reporters of moderate intensity physical activity; or that they did not adhere to the recommended wear time (i.e., minimum of 10 hours a day for at least 4 days during the week). If participants do not understand what moderate intensity physical activity is, even if they are making an effort to increase their activity, they may not achieve the health benefits associated with moderate intensity physical activity. Inaccurate reporting of physical activity suggests the need to provide more education about different intensities of physical activity. In the current study, physical activity intensities were verbally explained (e.g., moderate intensity physical activity accelerates heart rate and feels like you are walking fast to get out of the rain; walking at a pace of 3-4 miles per hour) but no demonstration was provided. Future studies should incorporate the use treadmills or hall way walks to demonstrate intensities of physical activity and should involve more frequent reminders to adhere to accelerometer wear protocol.

No changes in social support from family or friends were found in the current study from baseline to one-month. Given that there was not a significant change in pre-post intervention social support, it is not surprising that there was not a significant relationship between baseline to one-month changes in social support and changes in self-reported physical activity. A potential explanation for the lack of change in social support in the current study may be due to participants having to select their own social support

partner to share the website with and give a pedometer to, as opposed to being assigned an exercise partner as part of the study. A research staff member gave participants print and verbal information on social support for exercise, and encouragement to find an exercise partner. A potential limitation of this approach relied on the use of existing social support networks, making it challenging for participants without social networks to select an exercise partner. However, the majority of participants (n=18, 85.7% of study completers) in the current study reported giving the pedometer and/or the website log on to a person within their social network. Among study completers, most of the participants gave both the pedometer and website log on to the same person (n=16, 88.9%). Only two participants did not give the pedometer and website log on to anyone, and two others reported giving either the pedometer or the website log on (but not both) to a friend or family member. Participants most frequently selected their child to receive the pedometer (n=7, 33.3%) and website log on (n=6, 28.6%); five participants (23.8%) gave the pedometer and website log on to a friend, and three (14.3%) to a partner or spouse. In fact, among participants who gave the pedometer to a friend or family member, forty four percent (n=8) reported going for a walk with this person once a week or more, and 72% (n=13) agreed with the statements that giving the pedometer to a friend or family member motivated them to walk with that person and that it encouraged the participant to become more physically active. Similarly, fourteen (77.8%) participants who reported sharing the website log on with a friend or family member reported talking about the website with this person sometimes or often; and the majority (66.7%) agreed with the statement that sharing access to the website with a friend or family member motivated them to access the website more often.

Incorporating strategies for establishing social networks may be beneficial for increasing social support in future physical activity promotion studies with Latinas and should provide the option for participants to either select a social support partner from their existing network or be assigned one by research staff. Further, social support handouts and discussion occurred once during the current study; future interventions could provide more frequent social support promotion, such as weekly provision of social support information and discussions.

Similarly to social support, no relationship was found between baseline level of acculturation and changes in physical activity from baseline to one-month. Several previous studies examining the association of acculturation and physical activity have also shown the lack of a significant relationship between the two variables (Banna et al., 2012; Cantero et al., 1999; Keller & Cantue, 2008; Wilbur et al., 2003). In the current study the lack of association could be due the small sample size and generally low acculturation levels of participants. Studies with larger samples with a broader range of acculturation scores may help to further understand the association between acculturation and physical activity.

Strengths, Limitations, and Public Health Implications

Study Strengths

To our knowledge, this study represented one of the first physical activity interventions exclusively targeting Latina adult populations. The use of a web-based intervention provides an innovative approach to reach this at-risk population and address existing physical activity-related health disparities; especially since recent data indicate

Latinas have Internet access similar to Whites. Moreover, recent data suggests that Latinos were more likely than non-Hispanic Whites to have accessed physical activity, diet and nutrition information online (McCully et al., 2013). The web-based intervention used in this study provided health information that was culturally and linguistically adapted to meet the needs of Latinas, and can help to overcome barriers common to in-person interventions such as lack of transportation, childcare and family responsibilities, and fear of immigration authorities (D'Alonzo, 2012; Martinez et al., 2009).

A second strength of the current study was that it was grounded in the tenets of the Social Cognitive Theory and Transtheoretical Model, two of the most commonly used behavioral theories in physical activity promotion interventions. Behavioral theories are useful to inform the development, implementation and evaluation of public health programs by providing a framework for studying problem and explaining behavior, identifying the most suitable target populations, and the most effective approaches to intervene in changing a behavior or addressing a public health problem. (National Cancer Institute, 2005).

A third strength of the study was the high retention rate (87.5% completed all assessments). The high level of participant retention may be explained by the use of bilingual (Spanish-English)/bicultural research staff. Participants were able to contact research staff via email, cellular phone and text messaging, and at an office landline. Participants often communicated via text messaging regarding questions on study procedures or scheduling/rescheduling study visits. The same research staff member performed all of the Seven Day Physical Activity Recall assessments; thus, allowing for consistency in the interview process.

Another strength of the current study was the use of the ActiGraph activity monitor, an objective physical activity measure. The use of an objective measure in physical activity can reduce threats such as recall bias or over-reporting of physical activity (Sallis & Saelens, 2000), yet few web-based interventions to date have reported the use of objective measures of physical activity, such as accelerometry (Bosak et al., 2010; Dlugonski, Motl, & McAuley, 2011; Mailey et al., 2010; Wanner, Martin-Diener, Braun-Fahrländer, Bauer, & Martin, 2009).

Study Limitations

The current study also has several limitations. The study used a one group pre-post test design, leaving it open to threats to internal validity such as history, or concurrent events that may be responsible for changes in outcome variables. Another limitation is the small sample size, which can limit statistical power to find significant outcomes. The target population included self-identified Latina women (N=24) recruited in the Birmingham, Alabama region. Furthermore, Latinas can come from many countries and have different cultural backgrounds; thus, findings from this study may not be representative of Latina women in the United States or generalizable to a broader Latina population.

The current Internet-based intervention was also was delivered only in Spanish; however given the broad range of cultural and linguistic backgrounds among Latinos in the United States, future interventions should be offered both in English and in Spanish. Furthermore, studies that use written information and assessment in their interventions

should also incorporate the use of a literacy and reading comprehension screening tools such as the Short Test of Functional Literacy in Adults.

Lastly, although the intervention used in the current study had a one month duration, which was comparable to other physical activity interventions with Latinos (Albright et al., 2005; Avila & Hovell, 1994; Bopp et al., 2011; Hayashi et al., 2010; Leeman-Castillo et al., 2010), the short duration of the Internet-based intervention did not allow for assessment of longer-term sustainability of behavioral changes. A further issue relating to the short duration of the study it that it did not allow to assess seasonal variations in participants' physical activity levels. Most study activity took place during the late fall months. Previous studies have suggested that physical activity levels can vary with season differences (Lloyd & Miller, 2013; Ma et al., 2006). In one study on seasonal variation of physical activity among Mexican-American women, participants reported the greatest decrease in moderate-to-vigorous physical activity (-30.11 minutes per week) occurred in the in the fall season, while the greatest increase in physical activity (51.99 minutes per week) occurred during the spring (Lloyd & Miller, 2013).

Public Health Implications

The current study, Muévete Alabama, had a number of public health implications. Successful participant recruitment strategies, low attrition and improvement in self-reported physical activity provide support for using the Internet for intervening to promote physical activity in Latinas. Although social support and acculturation outcomes were not significant, further studies can help to gain more insight into the role that these variables play in the performance of physical activity. Furthermore, future studies should

also incorporate strategies to help Latina participant become better reporters of physical activity, such as providing treadmill demonstrations to teach what moderate intensity physical activity is. To promote adherence to accelerometer protocol, studies should also include more frequent reminders to wear accelerometer exactly as instructed during the accelerometer wear period.

The short duration of the study limits the ability to learn about sustainability of physical activity changes over a longer period of time. Longer-term studies and randomized trials designs are necessary to gain further understanding of the impact of such theory-based, culturally and linguistically adapted Internet-based interventions for Latinas. Internet based studies, such as Muévete Alabama, have the potential to reach a great number of individuals in efforts to promote physical activity and reduce related health disparities. Further, web-based interventions can be sustained with limited support from research staff, whereas in-person interventions are labor intensive and require greater personnel demand. During the current study, participants received a reminder from study staff to access the website; however, a physical activity website could be sustained to promote physical activity over longer periods of time with little, if any, contact with research staff. In fact, during the course of the study, a number of participants expressed interest in continuing to use the website beyond completion of the study.

Given the unique factors that influence physical activity in Latinas and the paucity of literature on Internet-based interventions in this population, further research is necessary to gain insight into the feasibility of this approach for promoting physical activity with Latinas. Latinos are the fastest growing ethnic minority in the United States

(Humes et al., 2011; WomensHealth.gov, 2012) with marked disparities in physical inactivity and health-related medical conditions (National Center for Health Statistics, 2011; Schiller et al., 2012), yet culturally appropriate physical activity interventions that specifically target this population remain scarce. Muévete Alabama represents one of the first culturally and linguistically adapted Internet-based physical activity interventions for Latina females and will contribute to the current gap in literature on innovative ways to reach this population and reduce physical activity-related health disparities.

List of References

Abraido-Lanza AF, White K, Vasques E. Immigrant populations and health. In: Anderson N, editor. Encyclopedia of health and behavior. Newbury Park, CA: Sage; 2004. p. 533–537

Acosta, Y. D., & DelaCruz, P. C. (2011). The foreign born from Latin American and the Caribbean: 2010. U.S. Census Bureau. Retrieved from: https://www.census.gov/prod/2011pubs/acsbr10-15.pdf

Albright, C. L., Pruitt, L., Castro, C., Gonzalez, A., Woo, S., & King, A. C. (2005). Modifying physical activity in a multiethnic sample of low-income women: one-year results from the IMPACT (Increasing Motivation for Physical Activity) project. *Annals of Behavioral Medicine, 30*(3), 191-200.

American College of Sports Medicine. (2005). *ACSM's Guidelines for Exercise Testing and Prescription, 7th ed.* . Philadelphia, PA: Lippincott Williams & Wilkins.

Avila, P., & Hovell, M. F. (1994). Physical activity training for weight loss in Latinas: a controlled trial. *International Journal of Obesity Related Metabolic Disorders, 18*(7), 476-482.

Ayala, G. X., & Team, S. D. P. R. C. (2011). Effects of a promotor-based intervention to promote physical activity: Familias Sanas y Activas. *American Journal of Public Health, 101*(12), 2261-2268.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control.* New York: W.H. Freeman.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive framework.* Englewood Cliffs, NJ: Prentice Hall.

Banna, J. C., Kaiser, L. L., Drake, C., & Townsend, M. S. (2012). Acculturation, physical activity and television viewing in Hispanic women: findings from the 2005 California Women's Health Survey. *Public Health Nutrition, 15*(2), 198-207.

Barrera, M., Jr., Toobert, D. J., & Strycker, L. A. (2014). Relative contributions of naturalistic and constructed support: two studies of women with type 2 diabetes. *Journal of Behavioral Medicine, 37*(1), 59-69.

Berry, J.W. (1989). In: Berman, J.J. Nebraska Symposium on Motivation (Vol. 27). Lincoln, NE: University of Nebraska Press.

Bopp, M., Fallon, E. A., & Marquez, D. X. (2011). A faith-based physical activity intervention for Latinos: outcomes and lessons. *American Journal of Health Promotion, 25*(3), 168-171.

Bosak, K. A., Yates, B., & Pozehl, B. (2010). Effects of an Internet physical activity intervention in adults with metabolic syndrome. *Western Journal of Nursing Research, 32*(1), 5-22.

Brown, D. L., Conley, K. M., Resnicow, K., Murphy, J., Sanchez, B. N., Cowdery, J. E., . . . Morgenstern, L. B. (2012). Stroke Health and Risk Education (SHARE): design, methods, and theoretical basis. *Contemporary Clinical Trials, 33*(4), 721-729.

Bungum, T. J., Thompson-Robinson, M., Moonie, S., & Lounsbery M, A. F. (2011). Correlates of physical activity among Hispanic adults. *Journal of Physical Activity & Health, 8(*3), 429-435.

Cantero, P. J., Richardson, J. L., Baezconde-Garbanati, L., & Marks, G. (1999). The association between acculturation and health practices among middle-aged and elderly Latinas. *Ethnicity & Disease, 9(*2), 166-180.

Carr, L. J., Dunsiger, S. I., Lewis, B., Ciccolo, J. T., Hartman, S., Bock, B., . . . Marcus, B. H. (2012). Randomized controlled trial testing an Internet physical activity intervention for sedentary adults. *Health Psychology, 32*(3), 328-36.

Castaneda, C., Layne, J. E., Munoz-Orians, L., Gordon, P. L., Walsmith, J., Foldvari, M., . . . Nelson, M. E. (2002). A randomized controlled trial of resistance exercise training to improve glycemic control in older adults with type 2 diabetes. *Diabetes Care, 25(*12), 2335-2341.

Castro, C., Sallis, J., Hickman, S., Lee, R., & Chen, H. (1999). A prospective study of psychosocial correlates of physical activity for ethnic minority women. P*sychology and Health, 14(*2), 227-293.

Centers for Disease Control and Prevention (2011). Physical Activity and Health. Retrieved from: http://www.cdc.gov/physicalactivity/everyone/health/

Centers for Disease Control and Prevention (2012). Physical Activity. Retrieved from: http://www.cdc.gov/physicalactivity/

Chen, A. H., Sallis, J. F., Castro, C. M., Lee, R. E., Hickmann, S. A., William, C., & Martin, J. E. (1998). A home-based behavioral intervention to promote walking in sedentary ethnic minority women: project WALK. *Womens Health, 4*(1), 19-39.

Christian, J. G., Byers, T. E., Christian, K. K., Goldstein, M. G., Bock, B. C., Prioreschi, B., & Bessesen, D. H. (2011). A computer support program that helps clinicians provide patients with metabolic syndrome tailored counseling to promote weight loss. *Journal of American Dietetic Association, 111*(1), 75-83.

Ciccolo, J. T., Lewis, B. L., & Marcus, B. (2008). Internet-based physical activity intervention. C*urrent Cardiovascular Risk Reports, 2,* 299-304.

Collins, R., Lee, R. E., Albright, C. L., & King, A. C. (2004). Ready to be physically active? The effects of a course preparing low-income multiethnic women to be more physically active. *Health Education & Behavior, 31(*1), 47-64.

Clarke, K. K., Freeland-Graves, J., Klohe-Lehman, D. M., Milani, T. J., Nuss, H. J., & Laffrey, S. (2007). Promotion of physical activity in low-income mothers using pedometers. Journal of the *American Dietetic Association, 107(6*), 962-967. doi: 10.1016/j.jada.2007.03.010

Comas-Dias, L. (1988). F*eminist Theory with Hispanic/Latina Women: Myth or Reality?* Binghamton, NY: Hayworth Press.

Cook, R. F., Billings, D. W., Hersch, R. K., Back, A. S., & Hendrickson, A. (2007). A field test of a web-based workplace health promotion program to improve dietary practices, reduce stress, and increase physical activity: randomized controlled trial. *Journal of Medical Internet Research, 9(*2), e17.

Coronado, G. D., Thompson, B., McLerran, D., Schwartz, S. M., & Koepsell, T. D. (2005). A short acculturation scale for Mexican-American populations. *Ethnicity and Disease, 15(*1), 53-62.

Cortés, D. E., Deren, S., Andía, J., Colón, H., Robles, R., & Kang, S. Y. (2003). The use of the Puerto Rican Biculturality Scale with Puerto Rican drug users in New York and Puerto Rico. *Journal Psychoactive Drugs, 35*(2), 197-207.

Crespo, C. J., Smit, E., Carter-Pokras, O., & Andersen, R. (2001). Acculturation and leisure-time physical inactivity in Mexican American adults: results from NHANES III, 1988-1994. *American Journal of Public Health, 91(*8), 1254-1257.

Cuéllar, I., Arnold, B., Gonzales, G. (1995). Cognitive referents of acculturation: Assessment of cultural constructs in Mexican Americans. *Journal of Community Psychology,* 23, 339-355.

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

D'Alonzo, K. T. (2012). The influence of marianismo beliefs on physical activity of immigrant Latinas. *Journal of Transcultural Nursing, 23(*2), 124-133.

D'Alonzo, K. T., & Fischetti, N. (2008). Cultural beliefs and attitudes of Black and Hispanic college-age women toward exercise. *Journal of Transcultural Nursing, 19(*2), 175-183.

Davies, C. A., Spence, J. C., Vandelanotte, C., Caperchione, C. M., & Mummery, W. K. (2012). Meta-analysis of internet-delivered interventions to increase physical activity levels. *International Journal of Behavioral Nutrition and Physical Activity, (9)52.*

Daviglus, M. L., Talavera, G. A., Aviles-Santa, M. L., Allison, M., Cai, J., Criqui, M. H., . . . Stamler, J. (2012). Prevalence of major cardiovascular risk factors and cardiovascular diseases among Hispanic/Latino individuals of diverse backgrounds in the United States. *JAMA, 308(*17), 1775-1784.

Deyo, R. A., Diehl, A. K., Hazuda, H., & Stern, M. P. (1985). A simple language-based acculturation scale for Mexican Americans: validation and application to health care research. *American Journal of Public Health, 75(1*), 51-55.

Dimaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). Digial Inequality: From unequal access to differentiated use. In K. Nekerman (Ed.), *Social Inequality (pp.* 355-400). New York, NY: Russell Sage Foundation.

Dishman, R. K., & Steinhardt, M. (1988). Reliability and concurrent validity for a 7-d re-call of physical activity in college students. *Medicine and Science in Sports Exercise, 20(*1), 14-25.

Dlugonski, D., Motl, R. W., & McAuley, E. (2011). Increasing physical activity in multiple sclerosis: replicating Internet intervention effects using objective and self-report outcomes. *Journal of Rehabilitation Research & Development, 48*(9), 1129-1136.

Dunton, G. F., & Robertson, T. P. (2008). A tailored Internet-plus-email intervention for increasing physical activity among ethnically-diverse women. *Preventive Medicine, 47(*6), 605-611.

Evenson, K. R., Sarmiento, O. L., & Ayala, G. X. (2004). Acculturation and physical activity among North Carolina Latina immigrants. *Social Science & Medicine, 59(1*2), 2509-2522.

Evenson, K. R., Sarmiento, O. L., Macon, M. L., Tawney, K. W., & Ammerman, A. S. (2002). Environmental, policy, and cultural factors related to physical activity among Latina immigrants. *Women and Health, 36(2*), 43-57.

Eyler, A. A., Brownson, R. C., Donatelle, R. J., King, A. C., Brown, D., & Sallis, J. F. (1999). Physical activity social support and middle- and older-aged minority women: results from a US survey. *Social Science & Medicine, 49(6*), 781-789.

Faghri, P. D., Omokaro, C., Parker, C., Nichols, E., Gustavesen, S., & Blozie, E. (2008). E-technology and pedometer walking program to increase physical activity at work. *The Journal of Primary Prevention, 29(1*), 73-91.

Fox, S., & Livingston, G. (2007). Hispanics with lower levels of education and English proficiency remain largely disconnected from the internet: Pew Hispanic Center. Retrieved from: http://files.eric.ed.gov/fulltext/ED495954.pdf

Ghaddar, S., Brown, C. J., Pagán, J. A., & Díaz, V. (2010). Acculturation and healthy lifestyle habits among Hispanics in United States-Mexico border communities. *Revista Panamericana de Salud Publica, 28(3*), 190-197.

Glasgow, R. E., Boles, S. M., McKay, H. G., Feil, E. G., & Barrera, M. (2003). The D-Net diabetes self-management program: long-term implementation, outcomes, and generalization results. *Preventative Medicine, 36(4), 4*10-419.

Glasgow, R. E., Kurz, D., King, D., Dickman, J. M., Faber, A. J., Halterman, E., . . . Ritzwoller, D. (2010). Outcomes of minimal and moderate support versions of an internet-based diabetes self-management support program. *Journal of General Internal Medicine, 25*(12), 1315-1322.

Glasgow, R. E., Kurz, D., King, D., Dickman, J. M., Faber, A. J., Halterman, E., . . . Ritzwoller, D. (2012). Twelve-month outcomes of an Internet-based diabetes self-management support program. *Patient and Education Counseling, 87*(1), 81-92.

Gow, R. W., Trace, S. E., & Mazzeo, S. E. (2010). Preventing weight gain in first year college students: an online intervention to prevent the "freshman fifteen". *Eating Behaviors, 11(1*), 33-39.

Go, A., Mozaffarian, D., Roger, V., Benjamin, E., Berry, J., Borden, W., . . . Turner, M. (2013). Heart disease and stroke statistics—2013 update: a report from the American Heart Association. American Heart Association.

Graham, R., & Smith, D. T. (2001). Internet as digital practice: Examining differences in African American internet usage. *Future Internet, 3, 185-2*03. doi: 10.2290/fi3030185

Grassi, K., Tello, P., & He, G. (1999). Physical activity training for weight loss in Latinas: A controlled trial. *Journal of Health Education, 30(*supplement 2), s13-s17.

Grim, M., Hortz, B., & Petosa, R. (2011). Impact evaluation of a pilot web-based intervention to increase physical activity. *American Journal of Health Promotion, 25*(4), 227-230.

Hamel, L. M., Robbins, L. B., & Wilbur, J. (2011). Computer- and web-based interventions to increase preadolescent and adolescent physical activity: a systematic review. *Journal of Advanced Nursing, 67(2)*, 251-268.

Hamilton, B. E., Martin, J. A., & Ventura, S. J. (2012). Births: Preliminary Data for 2011. *National Vital Statistics Reports (Vol. 61):* Centers for Disease Control and Prevention. Retrieved from: http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_05.pdf

Harralson, T. L., Emig, J. C., Polansky, M., Walker, R. E., Cruz, J. O., & Garcia-Leeds, C. (2007). Un Corazón Saludable: factors influencing outcomes of an exercise

program designed to impact cardiac and metabolic risks among urban Latinas. *Journal of Community Health, 32*(6), 401-412.

Harvey-Berino, J., Pintauro, S. J., & Gold, E. C. (2002). The feasibility of using Internet support for the maintenance of weight loss. *Behavior Modification, 26*(1), 103-116.

Hayashi, T., Farrell, M. A., Chaput, L. A., Rocha, D. A., & Hernandez, M. (2010). Lifestyle intervention, behavioral changes, and improvement in cardiovascular risk profiles in the California WISEWOMAN project. *Journal of Women's Health (Larchmt), 19*(6), 1129-1138.

Hayden, J. (2009). *Introduction to Health Behavior*. Sudbury, MA: Jones and Bartlett Publishers.

Hazuda, H. P., Haffner, S. M., Stern, M. P., & Eifler, C. W. (1988). Effects of acculturation and socioeconomic status on obesity and diabetes in Mexican Americans: The San Antonio Heart Study. *American Journal of Epidemiology, 128*(6), 1289-1301.

Hovell, M. F., Mulvihill, M. M., Buono, M. J., Liles, S., Schade, D. H., Washington, T. A., . . . Sallis, J. F. (2008). Culturally Tailored Aerobic Exercise Intervention for Low-income Latinas. *American Journal of Health Promotion, 22*(3), 155-163.

Humes, K. A., Jones, N. A., & Ramirez, R. R. (2011). Overview of Race and Hispanic Origin: 2010. U.S. Census Bureau. Retrieved from: http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf

Hurling, R., Catt, M., Boni, M. D., Fairley, B. W., Hurst, T., Murray, P., . . . Sodhi, J. S. (2007). Using internet and mobile phone technology to deliver an automated physical activity program: randomized controlled trial. *Journal of Medical Internet Research, 9*(2), e7.

Ickes, M. J., & Sharma, M. (2012). A systematic review of physical activity interventions in Hispanic adults. *Journal of Environmental Public Health*, 2012, 156435.

Jenkins, A., Christensen, H., Walker, J. G., & Dear, K. (2009). The effectiveness of distance interventions for increasing physical activity: a review. *American Journal of Health Promotion, 24*(2), 102-117.

Joseph, R., Durant, N., Benitez, T., & Pekmezi, D. W. (2013). Internet-Based Physical Activity Interventions. Americ*an Journal of Lifestyle Medicine, 8(1), 4*2-67.

Juarbe, T., Turok, X. P., & Pérez-Stable, E. J. (2002). Perceived benefits and barriers to physical activity among older Latina women. *Western Journal of Nursing Research, 24*(8), 868-886.

Jurkowski, J. M., Mosquera, M., & Ramos, B. (2010). Selected Cultural Factors Associated with Physical Activity Among Latino Women. *Women's Health Issues, 20*(3)*,* 219-226.

Keller, C. S., & Cantue, A. (2008). Camina por Salud: walking in Mexican-American women. *Applied Nursing Research, 21*(2), 110-113.

Kim, C. J., & Kang, D. H. (2006). Utility of a Web-based intervention for individuals with type 2 diabetes: the impact on physical activity levels and glycemic control. *Computer Informatics Nursing*, *24*(6), 337-345.

Keller, C., Records, K., Ainsworth, B., Belyea, M., Permana, P., Coonrod, D., . . . Nagle-Williams, A. (2011). Madres para la Salud: Design of a theory-based intervention for postpartum Latinas. *Contemporary Clinical Trials, 32(3), 4*18-427.

Keller, C., & Trevino, R. P. (2001). Effects of two frequencies of walking on cardiovascular risk factor reduction in Mexican American women. *Research in Nursing and Health, 24(5), 3*90-401.

Kim, S., Koniak-Griffin, D., Flaskerud, J. H., & Guarnero, P. A. (2004). The impact of lay health advisors on cardiovascular health promotion: using a community-based participatory approach. *Journal Cardiovascular Nursing, 19*(3), 192-199.

Lachausse, R. G. (2012). My student body: effects of an internet-based prevention program to decrease obesity among college students. *Journal of American College Health, 60(4),* 324-330.

Larkey, L. (2006). Las mujeres saludables: reaching Latinas for breast, cervical and colorectal cancer prevention and screening. *Journal of Community Health, 31*(1), 69-77.

Lau, P. W., Lau, E. Y., Wong del, P., & Ransdell, L. (2011). A systematic review of information and communication technology-based interventions for promoting physical activity behavior change in children and adolescents *Journal of Medical Internet Research, 13*, pp. e48.

Leeman-Castillo, B., Beaty, B., Raghunath, S., Steiner, J., & Bull, S. (2010). LUCHAR: using computer technology to battle heart disease among Latinos. *American Journal of Public Health, 100*(2)*,* 272-275.

Livingston, G. (2011). Latinos and Digital Technology, 2010. Pew Hispanic Center. Retrieved from: http://www.pewhispanic.org/2011/02/09/latinos-and-digital-technology-2010/

Magoc, D., Tomaka, J., & Bridges-Arzaga, A. (2011). Using the web to increase physical activity in college students. *American Journal of Health Behavior, 35*(2)*,* 142-154.

Mailey, E. L., Wójcicki, T. R., Motl, R. W., Hu, L., Strauser, D. R., Collins, K. D., & McAuley, E. (2010). Internet-delivered physical activity intervention for college students with mental health disorders: a randomized pilot trial. *Psychology, Health and Medicine, 15*(6)*,* 646-659.

Mainous, A. G., Diaz, V. A., & Geesey, M. E. (2008). Acculturation and healthy lifestyle among Latinos with diabetes. *Annals of Family Medicine, 6*(2), 131-137.

Marcus, B. H., Ciccolo, J. T., & Sciamanna, C. N. (2009). Using electronic/computer interventions to promote physical activity. *British Journal of Sports Medicine, 43*(2)*,* 102-105.

Marín, G., Sabogal, F., VanOss Marin, B., Otero-Sabogal, R., & Perez-Stable, E. (1987). Development of a Short Acculturation Scale for Hispanics. *Hispanic Journal of Behavioral Sciences, 9*(2), *1*38-205.

Marquez, B., & Wing, R. R. (2013). Feasibility of enlisting social network members to promote weight loss among Latinas. *Journal of the Academy of Nutrition and Dietetics, 113*(5), 680-687.

Marquez, D. X., & McAuley, E. (2006a). Gender and acculturation influences on physical activity in Latino adults. *Annals of Behavioral Medicine, 31*(2), 138-144.

Marquez, D. X., & McAuley, E. (2006b). Social cognitive correlates of leisure time physical activity among Latinos. *Journal of Behavioral Medicine, 29*(3), 281-289.

Martinez, S. M., Arredondo, E. M., Perez, G., & Baquero, B. (2009). Individual, social, and environmental barriers to and facilitators of physical activity among Latinas living in San Diego County: focus group results. *Family & Community Health, 32*(1), 22-33.

McAuley, E., Jerome, G. J., Elavsky, S., Marquez, D. X., & Ramsey, S. N. (2003). Predicting long-term maintenance of physical activity in older adults. *Preventive Medicine, 37*(2), 110-118.

McCully, S. N., Don, B. P., & Updegraff, J. A. (2013). Using the Internet to help with diet, weight, and physical activity: results from the Health Information National Trends Survey (HINTS). *Journal of Medical Internet Research*, *15*(8), e148.

McKay, H. G., King, D., Eakin, E. G., Seeley, J. R., & Glasgow, R. E. (2001). The diabetes network internet-based physical activity intervention: a randomized pilot study. *Diabetes Care*, *24*(8), *1328-1334.*

Mier, N., Medina, A. A., & Ory, M. G. (2007). Mexican Americans with type 2 diabetes: perspectives on definitions, motivators, and programs of physical activity. *Preventing Chronic Disease, 4*(2), A24.

Mier, N., Tanguma, J., Millard, A. V., Villarreal, E. K., Alen, M., & Ory, M. G. (2011). A pilot walking program for Mexican-American women living in colonias at the border. *American Journal of Health Promotion, 25*(3), 172-175.

Moreno, F. A., Chong, J., Dumbauld, J., Humke, M., & Byreddy, S. (2012). Use of standard Webcam and Internet equipment for telepsychiatry treatment of depression among underserved Hispanics. *Psychiatric Service, 63*(12), 1213-1217.

National Cancer Institute. *Theory at a Glance. A Guide for Health Promotion Practice.* 2nd ed. Bethesda, MD: U.S. Department of Health and Human Services, Public Health Service, National Institutes of health, National Cancer Institute.; 2005.

National Center for Health Statistics. (2011). Health, United States, 2011: With Special Feature on Socioeconomic Status and Health. Hyattsville, MD. 2012. Retrieved from: http://www.cdc.gov/nchs/data/hus/hus11.pdf

Office of Management and Budget. (1997). Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. Retrieved from: http://www.whitehouse.gov/omb/fedreg_1997standards/

Olvera, N., Bush, J. A., Sharma, S. V., Knox, B. B., Scherer, R. L., & Butte, N. F. (2010). BOUNCE: a community-based mother-daughter healthy lifestyle intervention for low-income Latino families. *Obesity (Silver Spring), 18 Suppl 1,* S102-104.

Pallant, J. (2007). *SPSS Survival Manual.* New York, NY: The McGraw-Hill Companies.

Patrick, K., Calfas, K. J., Norman, G. J., Rosenberg, D., Zabinski, M. F., Sallis, J. F., . . . Dillon, L. W. (2011). Outcomes of a 12-month web-based intervention for overweight and obese men. *Annals of Behavioral Medicine, 42*(3), *39*1-401.

Pekmezi, D., Dunsiger, S., Gans, K., Bock, B., Gaskins, R., Marquez, B., . . . Marcus, B. (2012). Rationale, design, and baseline findings from Seamos Saludables: a randomized controlled trial testing the efficacy of a culturally and linguistically adapted, computer- tailored physical activity intervention for Latinas. *Contemporary Clinical Trials, 33*(6), 1261-1271.

Pekmezi, D., Marquez, B., & Marcus-Blank, J. (2009). Health promotion in Latinos. American *Journal of Lifestyle Medicine,* 4(2), 151-165.

Pekmezi, D. W., Neighbors, C. J., Lee, C. S., Gans, K. M., Bock, B. C., Morrow, K. M., . . . Marcus, B. H. (2009). A culturally adapted physical activity intervention for Latinas: a randomized controlled trial. *American Journal of Preventive Medicine, 37*(6), 495-500.

Plasqui, G., & Westerterp, K. R. (2007). Physical activity assessment with accelerometers: an evaluation against doubly labeled water. *Obesity (Silver Spring), 15*(10), 2371-2379.

Plotnikoff, R. C., McCargar, L. J., Wilson, P. M., & Loucaides, C. A. (2005). Efficacy of an E-mail intervention for the promotion of physical activity and nutrition behavior in the workplace context. *American Journal of Health Promotion, 19*(6), *422*-429.

Poston, W. S., Haddock, C. K., Olvera, N. E., Suminski, R. R., Reeves, R. S., Dunn, J. K., . . . Foreyt, J. P. (2001). Evaluation of a culturally appropriate intervention to increase physical activity. *American Journal of Health Behavior, 25*(4), 396-406.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), *390*-395.

Ramirez, A. G., Chalela, P., Gallion, K., & Velez, L. F. (2007). Energy balance feasibility study for Latinas in Texas: a qualitative assessment. *Preventing Chronic Disease, 4*(4), A*9*8.

Resnick, B., Orwig, D., Magaziner, J., & Wynne, C. (2002). The effect of social support on exercise behavior in older adults. *Clinical Nursing Research, 11*(1), *52*-70.

Richardson, C. R., Mehari, K. S., McIntyre, L. G., Janney, A. W., Fortlage, L. A., Sen, A., . . . Piette, J. D. (2007). A randomized trial comparing structured and lifestyle goals in an internet-mediated walking program for people with type 2 diabetes. *Journal of Medical Internet Research*, *4*(59).

Rovniak, L. S., Hovell, M. F., Wojcik, J. R., Winett, R. A., & Martinez-Donate, A. P. (2005). Enhancing theoretical fidelity: an e-mail-based walking program demonstration. *American Journal of Health Promotion, 20*(2), *85*-95.

Sallis, J. F., Grossman, R. M., Pinski, R. B., Patterson, T. L., & Nader, P. R. (1987). The development of scales to measure social support for diet and exercise behaviors. *Preventive Medicine, 16*(6), *825*-836.

Sallis, J. F., Haskell, W. L., Wood, P. D., Fortmann, S. P., Rogers, T., Blair, S. N., & Paffenbarger, R. S., Jr. (1985). Physical activity assessment methodology in the Five-City Project. *American Journal of Epidemiology, 121*(1), *91*-106.

Sallis, J. F., Patterson, T. L., Buono, M. J., & Nader, P. R. (1988). Relation of cardiovascular fitness and physical activity to cardiovascular disease risk factors in children and adults. *American Journal of Epidemiology*, 127(5), *933-941.*

Schiller, J. S., Lucas, J. W., Ward, B. W., & Peregoy, J. A. (2012). Summary health statistics for U.S. adults: National Health Interview Survey, 2010. *Vital Health Statistics. Series 10, Data from the National Health Survey, (252),* 1-207.

Smith, D. T., Carr, L. J., Dorozynski, C., & Gomashe, C. (2009). Internet-delivered lifestyle physical activity intervention: limited inflammation and antioxidant

capacity efficacy in overweight adults. *Journal of Applied Physiology, 106*(1), 49-56.

Spinner, J. R., & Alvarado, M. (2012). Salud Para Su Carozón--a Latino promotora-led cardiovascular health education program. *Family and Community Health, 35*(2)*, 111*-119.

Staten, L. K., Scheu, L. L., Bronson, D., Peña, V., & Elenes, J. (2005). Pasos Adelante: the effectiveness of a community-based chronic disease prevention program. *Preventing Chronic Disease, 2*(1), A18.

Staten, L. K., Cutshaw, C. A., Davidson, C., Reinschmidt, K., Stewart, R., & Roe, D. J. (2012). Effectiveness of the Pasos Adelante chronic disease prevention and control program in a US-Mexico border community, 2005-2008. *Preventing Chronic Disease, 9*, E08.

Staten, L. K., Gregory-Mercado, K. Y., Ranger-Moore, J., Will, J. C., Giuliano, A. R., Ford, E. S., & Marshall, J. (2004). Provider counseling, health education, and community health workers: the Arizona WISEWOMAN project. *Journal of Women's Health (Larchmt), 13*(5), 547-556.

Sternfeld, B., Block, C., Quesenberry, C. P., Block, T. J., Husson, G., Norris, J. C., . . . Block, G. (2009). Improving diet and physical activity with ALIVE: a worksite randomized trial. *American Journal of Preventive Medicine, 36*(6), 475-483.

Stevens, E. (1973). Marianismo: The Other Side of Machismo in Latin America. Descastello (Ed.), *Female and Male in Latin America.* Pittsburgh, PA: University of Pittsburgh Press.

Suarez, L. (1994). Pap smear and mammogram screening in Mexican-American women: the effects of acculturation. *American Journal of Public Health, 84*(5), 742-746.

Szapocznik, J.; Scopetta, M.A.; Kurtines, W.; Aranalde, M.D. (1978) *Revista Interamericana de Psicología,* Vol 12(2), 1978, 113-130.

Tate, D. F., Wing, R. R., & Winett, R. A. (2001). Using Internet technology to deliver a behavioral weight loss program. *JAMA, 285*(9), 1172-1177.

Toobert, D. J., Strycker, L. A., Barrera, M., Jr., Osuna, D., King, D. K., & Glasgow, R. E. (2011). Outcomes from a multiple risk factor diabetes self-management trial for Latinas: !Viva Bien! *Translational Behavioral Medicine, 1*(3): 416–426.

Troiano, R. P., Berrigan, D., Dodd, K. W., Mâsse, L. C., Tilert, T., & McDowell, M. (2008). Physical activity in the United States measured by accelerometer. *Medicine and Science in Sports and Exercise, 40*(1), 181-188.

Uchino, B. N. (2004). The meaning and measurement of social support Social Support and Phy*sical Health: Understanding the Health Consequences of Relationships (pp. 9-13)*. United States: Yale University Press.

U.S. Department of Commerce, National Telecommunications and Information Administration. (2011). *Digital nation: Expanding internet use.* Retrieved from: http://www.ntia.doc.gov

U.S. Department of Health and Human Services. (November, 2000). *With Understanding and Improving Health and Objectives for Improving Health.* Healthy People 2010. 2nd ed. Retrieved from: http://www.healthequityks.org/download/Hllthy_People_2010_Improving_Health.pdf

U.S. Department of Health and Human Services, Office of Women's Health. (2012). *Minority Women's Health.* Retrieved from: http://womenshealth.gov/minority-health/latinas/

United States Department of Commerce. (2012). *2010 Census Population and Housing Tables.* Retrieved from: http://www.census.gov/population/www/cen2010/cph-t/cph-t.html

van den Berg, M. H., Schoones, J. W., & Vliet Vlieland, T. P. (2007). Internet-based physical activity interventions: a systematic review of the literature. *Journal of Medical Internet Research, 9*(3), e26.

Van Wieren, A. J., Roberts, M. B., Arellano, N., Feller, E. R., & Diaz, J. A. (2011). Acculturation and cardiovascular behaviors among Latinos in California by country/region of origin. *Journal of Immigrant & Minority Health, 13*(6), *975*-981.

Vandelanotte, C., Spathonis, K. M., Eakin, E. G., & Owen, N. (2007). Website-delivered physical activity interventions a review of the literature. *American Journal of Preventive Medicine, 33*(1), 54-64.

Vyas, A., Madhavan, S., LeMasters, T., Atkins, E., Gainor, S., Kennedy, S., . . . Remick, S. (2012). Factors influencing adherence to mammography screening guidelines in Appalachian women participating in a mobile mammography program. *Journal of Community Health, 37*(3), 632-646.

Wanner, M., Martin-Diener, E., Braun-Fahrländer, C., Bauer, G., & Martin, B. W. (2009). Effectiveness of active-online, an individually tailored physical activity intervention, in a real-life setting: randomized controlled trial. *Journal of Medical Internet Research, 11*(3), e23.

Washburn, R. A., Jacobsen, D. J., Sonko, B. J., Hill, J. O., & Donnelly, J. E. (2003). The validity of the Stanford Seven-Day Physical Activity Recall in young adults. *Medicine and Science in Sports Exercise, 35*(8), 1374-1380.

Weight Control Information Network (2013). Overweight and Obsesity Statistics. Retrieved from: http://win.niddk.nih.gov/statistics/

Wilbur, J., Chandler, P. J., Dancy, B., & Lee, H. (2003). Correlates of physical activity in urban Midwestern Latinas. *American Journal of Preventive Medicine, 25*(3 Suppl 1), 69-76.

World Health Organization (2013). Physical Activity. Retrieved from: http://www.who.int/topics/physical_activity/en/

Yan, T., Wilber, K. H., Aguirre, R., & Trejo, L. (2009). Do sedentary older adults benefit from community-based exercise? Results from the Active Start program. *Gerontologist, 49*(6), 847-855.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

Project Revision/Amendment Form

Form version: June 26, 2012

In MS Word, click in the white boxes and type your text; double-click checkboxes to check/uncheck.

- **Federal regulations require IRB approval before implementing proposed changes. See Section 14 of the IRB Guidebook for Investigators for additional information.**
- **Change means any change, in content or form, to the protocol, consent form, or any supportive materials (such as Investigator Brochure, questionnaires, surveys, advertisements, etc.). See Item 4 for more examples.**

1. Today's Date	7/9/13

2. Principal Investigator (PI)

Name (with degree)	Dorothy Pekmezi, PhD	Blazer ID	dpekmezi
Department	Public Health	Division (if applicable)	
Office Address	1665 University Blvd., 227 RPHB	Office Phone	205-975-8061
E-mail	dpekmezi@uab.edu	Fax Number	205-934-9325

Contact person who should receive copies of IRB correspondence (Optional)

Name	Tanya Benitez	E-Mail	tbenitez@uab.edu
Phone		Fax Number	205-934-9325
Office Address (if different from PI)			

3. UAB IRB Protocol Identification

3.a. Protocol Number	X111219009
3.b. Protocol Title	"Using interactive Internet technology to promote physical activity in Latinas"

3.c. Current Status of Protocol—Check ONE box at left; provide numbers and dates where applicable

- ☒ Study has not yet begun — No participants, data, or specimens have been entered.
- ☐ In progress, open to accrual — Number of participants, data, or specimens entered:
- ☐ Enrollment temporarily suspended by sponsor
- ☐ Closed to accrual, but procedures continue as defined in the protocol (therapy, intervention, follow-up visits, etc.)
  - Date closed:
  - Number of participants receiving interventions:
  - Number of participants in long-term follow-up only:
- ☐ Closed to accrual, and only data analysis continues
  - Date closed:
  - Total number of participants entered:

4. Types of Change

Check all types of change that apply, and describe the changes in Item 5.c. or 5.d. as applicable. To help avoid delay in IRB review, please ensure that you provide the required materials and/or information for each type of change checked.

- ☒ **Protocol revision (change in the IRB-approved protocol)**
  In Item 5.c., if applicable, provide sponsor's protocol version number, amendment number, update number, etc.
- ☒ **Protocol amendment (addition to the IRB-approved protocol)**
  In Item 5.c., if applicable, provide funding application document from sponsor, as well as sponsor's protocol version number, amendment number, update number, etc.
- ☐ **Add or remove personnel**
  In Item 5.c., include name, title/degree, department/division, institutional affiliation, and role(s) in research, and address whether new personnel have any conflict of interest. See "Change in Principal Investigator" in the IRB Guidebook if the principal investigator is being changed.
  - ☐ **Add graduate student(s) or postdoctoral fellow(s) working toward thesis, dissertation, or publication**
    In Item 5.c., (a) identify these individuals by name; (b) provide the working title of the thesis, dissertation, or publication; and (c) indicate whether or not the student's analysis differs in any way from the purpose of the research described in the IRB-approved HSP (e.g., a secondary analysis of data obtained under this HSP).
- ☐ **Change in source of funding; change or add funding**
  In Item 5.c., describe the change or addition in detail, include the applicable OSP proposal number(s), and provide a copy of the application as funded (or as submitted to the sponsor if pending). Note that some changes in funding may require a new IRB application.

☐ **Add or remove performance sites**
In Item 5.c., identify the site and location, and describe the research-related procedures performed there. If adding site(s), attach notification of permission or IRB approval to perform research there. Also include copy of subcontract, if applicable. If this protocol includes acting as the Coordinating Center for a study, attach IRB approval from any non-UAB site added.

☐ **Add or change a genetic component or storage of samples and/or data component—this could include data submissions for Genome-Wide Association Studies (GWAS)**
To assist you in revising or preparing your submission, please see the IRB Guidebook for Investigators or call the IRB office at 934-3789.

☐ **Suspend, re-open, or permanently close protocol to accrual of individuals, data, or samples (IRB approval to remain active)**
In Item 5.c., indicate the action, provide applicable dates and reasons for action; attach supporting documentation.

☐ **Report being forwarded to IRB (e.g., DSMB, sponsor or other monitor)**
In Item 5.c., include date and source of report, summarize findings, and indicate any recommendations.

☐ **Revise or amend consent, assent form(s)**
Complete Item 5.d.

☐ **Addendum (new) consent form**
Complete Item 5.d.

☐ **Add or revise recruitment materials**
Complete Item 5.d.

☐ **Other (e.g., Investigator brochure)**
Indicate the type of change in the space below, and provide details in Item 5.c. or 5.d. as applicable.
Include a copy of all affected documents, with revisions highlighted as applicable.

▶

5. Description and Rationale

In Item 5.a. and 5.b, check Yes or No and see instructions for Yes responses.
In Item 5.c. and 5.d, describe—and explain the reason for—the change(s) noted in Item 4.

☐Yes ☒No **5.a. Are any of the participants enrolled as normal, healthy controls?**
If yes, describe in detail in Item 5.c. how this change will affect those participants.

☐Yes ☒No **5.b. Does the change affect subject participation, such as procedures, risks, costs, location of services, etc.?**
If yes, FAP-designated units complete a FAP submission and send to fap@uab.edu. Identify the FAP-designated unit in Item 5.c.
For more details on the UAB FAP, see www.uab.edu/cto.

5.c. Protocol Changes: In the space below, briefly describe—and explain the reason for—all change(s) to the protocol.

- **A handout/pamphlet with information on social support will be given to participants (see attached).**
- **A list of resources for physical activity will be given to participants (see attached).**
- **Eight questions will be added to the previously IRB approved Consumer Satisfaction questionnaire (see attached questionnaire with revisions highlighted).**
- **In addition to their own log on to the study website (as described in previous IRB protocol), participants will be given an additional log on to the study website to voluntarily share with a friend or family member of their choice. The purpose of having participants invite a friend or family member to access the same website is to increase social support for exercise by having a peer to discuss the study website with. No personal or identifying information will be collected from the participant's friend or family member.**
- **Tanya Benitez will use data for her dissertation from the current study (IRB protocol X111219009). She is presently approved on the current HSP. Her dissertation is titled "Acculturation and Social Support as predictors of physical activity in a web-based intervention for Latinas." Her primary research questions will examine the variables of physical activity, social support and acculturation; however, all data collected in the current study will be available for analysis in Ms. Benitez's dissertation. Ms. Benitez will only be using data for her dissertation that has been collected in the present study (protocol X111219009) using IRB approved measures. She will not be collecting any new data or adding any new data collection instruments and her data analyses do not differ from the purpose of the research described in the current IRB-approved protocol.**

5.d. Consent and Recruitment Changes: In the space below,
(a) describe all changes to IRB-approved forms or recruitment materials and the reasons for them;
(b) describe the reasons for the addition of any materials (e.g., addendum consent, recruitment); and
(c) indicate either how and when you will reconsent enrolled participants or why reconsenting is not necessary (not applicable for recruitment materials).

Also, indicate the number of forms changed or added. For new forms, provide 1 copy. For revised documents, provide 3 copies:
- a copy of the currently approved document (showing the IRB approval stamp, if applicable)
- a revised copy highlighting all proposed changes with "tracked" changes
- a revised copy for the IRB approval stamp.

Signature of Principal Investigator _____ Date 7/9/13

FOR IRB USE ONLY

☐ Received & Noted ☑ Approved Expedited* ☐ To Convened IRB

Marilyn Dass — Signature (Chair, Vice-Chair, Designee)

7-12-13 — Date

DOLA 8-1-13

Change to Expedited Category Y / N / NA

*No change to IRB's previous determination of approval criteria at 45 CFR 46.111 or 21 CFR 56.111

APPENDIX B

DATA COLLECTION INSTRUMENTS

Social Support and Exercise Survey

Below is a list of things people might do or say to someone who is trying to Exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question. Please rate each question *twice*. Under "Family," rate how often anyone living in your household has said or done what is described during the last three months. Under "Friends", rate how often your friends, acquaintances, or coworkers have said or done what is described during the last three months. Please write one number from the following scale in each space:

None	Rarely	A few times	Often	Very often	Does not apply
1	2	3	4	5	6

During the past three months my family (or members of my household) or friends:

	Family	Friends
1. Exercise with me.		
2. Offered to exercise with me.		
3. Gave me helpful reminders to exercise ("Are you going to exercise tonight?")		
4. Gave me encouragement to stick with my exercise program.		
5. Changed their schedule so we could exercise together.		
6. Discussed exercise with me.		
7. Complained about the time I spend exercising.		
8. Criticized me or made fun of me for exercising.		
9. Gave me rewards for exercising (bought me something or gave me something I like).		
10. Planned for exercise on recreational outings.		
11. Helped plan activities around my exercise.		
12. Asked me for ideas on how they can get more exercise.		
13. Talked about how much they like to exercise.		
14. Helped with childcare so that I could exercise.		

Encuesta de Ejercicio y Apoyo Social

Abajo se encuentra una lista de cosas que la gente podría decirle a alguien que está tratando de hacer ejercicio regularmente. Si usted no está tratando de hacer ejercicio, entonces es posible que algunas de las preguntas no sean aplicables a usted. De todas formas, por favor lea y conteste cada pregunta. Por favor conteste cada pregunta dos veces. Bajo "Familia," escriba la respuesta que describe con qué frecuencia durante los últimos tres meses cualquier persona que vive en su hogar ha dicho o hecho lo que la pregunta describe. Bajo "Amigos," escriba la respuesta que describe con qué frecuencia durante los últimos tres meses sus amigos, compañeros de trabajo han dicho o hecho lo que la pregunta describe. Por favor escriba un número de la siguiente escala de calificaciones en cada espacio:

Nunca	Rara vez	Algunas veces	Frecuentemente	Con mucha frecuencia	No es aplicable
1	2	3	4	5	6

Durante los tres meses pasados, mi familia (o miembros de mi hogar) o amigos:

	Familia	Amigos
1. Hicieron ejercicios conmigo.		
2. Ofrecieron hacer ejercicios conmigo.		
3. Me ayudaron a recordarme que hiciera ejercicios ("Vas a hacer ejercicios hoy?")		
4. Me dieron aliento para seguir con mi programa de ejercicios.		
5. Cambiaron su horario para que pudiéramos hacer ejercicios juntos.		
6. Hablaron conmigo sobre el ejercicio.		
7. Se quejaron sobre el tiempo que he pasado hacienda ejercicios.		
8. Me criticaron o se burlaron de mí por hacer ejercicios.		
9. Me dieron premios por hacer ejercicios (me compraron o me dieron algo que me gusta)		
10. Planearon hacer ejercicios durante excursiones recreativas.		
11. Ayudaron a planear actividades con mis ejercicios en mente.		
12. Me pidieron consejos sobre cómo ellos pueden hacer más ejercicios.		
13. Hablaron sobre cuánto les gusta hacer ejercicio.		
14. Ayudaron con el cuido de los niños para que pudiera hacer ejercicios.		

Short Acculturation Scale

In general, what language(s) do you read and speak?

Only Spanish 1
Spanish better than English..... 2
Both equally..... 3
English better than Spanish..... 4
Only English..... 5

What was the language(s) you used as a child?

Only Spanish 1
More Spanish than English..... 2
Both equally..... 3
More English than Spanish..... 4
Only English..... 5

What language(s) do you usually speak at home?

Only Spanish 1
More Spanish than English..... 2
Both equally..... 3
More English than Spanish..... 4
Only English..... 5

In which language(s) do you usually think?

Only Spanish 1
More Spanish than English..... 2
Both equally..... 3
More English than Spanish..... 4
Only English..... 5

What language(s) do you usually speak with your friends?

Only Spanish 1
More Spanish than English..... 2
Both equally..... 3
More English than Spanish..... 4
Only English..... 5

In what language(s) are the TV programs you usually watch?

Only Spanish 1
More Spanish than English 2
Both equally 3
More English than Spanish 4
Only English 5

In what language(s) are the radio programs you usually listen to?

Only Spanish 1
More Spanish than English 2
Both equally 3
More English than Spanish 4
Only English 5

In general, in what language(s) are the movies, TV, and radio programs you *prefer* to watch and listen to?

Only Spanish 1
More Spanish than English 2
Both equally 3
More English than Spanish 4
Only English 5

Your close friends are:

All Latinos/Hispanics 1
More Latinos than Americans 2
About Half & Half 3
More Americans than Latinos 4
All Americans 5

You prefer going to social gatherings/parties at which the people are:

All Latinos/Hispanics 1
More Latinos than Americans 2
About Half & Half 3
More Americans than Latinos 4
All Americans .....

The persons you visit or who visit you are:

All Latinos/Hispanics..... 1
More Latinos than Americans..... 2
About Half & Half..... 3
More Americans than Latinos..... 4
All Americans..... 5

If you could choose your children's friends, you would want them to be:

All Latinos/Hispanics..... 1
More Latinos than Americans..... 2
About Half & Half..... 3
More Americans than Latinos..... 4
All Americans..... 5

Short Acculturation Scale (Spanish)

¿Por lo general, que idioma leé y habla usted?

Solo Español 1
Español mejor que Inglés..... 2
Ambos por igual 3
Inglés mejor que Español..... 4
Solo Inglés 5

¿Cuál fué el idioma que habló cuando era niño(a)?

Solo Español 1
Más Español que Inglés..... 2
Ambos por igual 3
Más Inglés que Español..... 4
Solo Inglés 5

Por lo general, ¿en qué idioma(s) habla en su casa?

Solo Español 1
Más Español que Inglés..... 2
Ambos por igual 3
Más Inglés que Español..... 4
Solo Inglés 5

Por lo general, ¿en qué idioma(s) piensa?

Solo Español 1
Más Español que Inglés..... 2
Ambos por igual 3
Más Inglés que Español..... 4
Solo Inglés .....

Por lo general, ¿en qué idioma(s) habla con sus amigos(as)?

Solo Español 1
Más Español que Inglés..... 2
Ambos por igual 3
Más Inglés que Español..... 4
Solo Inglés 5

Por lo general, ¿en qué idioma(s) son los programas de televisión que usted vé?

Solo Español 1
Más Español que Inglés 2
Ambos por igual 3
Más Inglés que Español 4
Solo Inglés 5

Por lo general, ¿en qué idioma(s) son los programas de radio que usted escucha?

Solo Español 1
Más Español que Inglés 2
Ambos por igual 3
Más Inglés que Español 4
Solo Inglés 5

Por lo general, ¿en qué idioma(s) prefiere oir y ver películas, y programas de radio y television?

Solo Español 1
Más Español que Inglés 2
Ambos por igual 3
Más Inglés que Español 4
Solo Inglés 5

Sus amigos y amigas más cercanos son:

Solo Latinos 1
Más Latinos que Americanos 2
Casi mitad y mitad 3
Más Americanos que Latinos 4
Solo Americanos 5

Usted prefiere ir a reuniones sociales/fiestas en las cuales las personas son:

Solo Latinas 1
Más Latinas que Americanas 2
Casi mitad y mitad 3
Más Americanas que Latinas 4
Solo Americanas 5

Las personas que usted visita o que le visiten son:

Solo Latinas 1
Más Latinas que Americanas..... 2
Casi mitad y mitad..... 3
Más Americanas que Latinas..... 4
Solo Americanas 5

Si usted pudiera escojer los amigos(as) de sus hijos(as), quisiera ellos(as) fueran:

Solo Latinos 1
Más Latinos que Americanos..... 2
Casi mitad y mitad..... 3
Más Americanos que Latinos..... 4
Solo Americanos 5

ID: ☐☐☐☐ Session: Base M1 Date Completed: ☐☐ ☐☐ ☐☐

Physical Activity Recall

Day of the week form completed: Sun Mon Tues Wed Thur Frid Sat Date of 1st day of PAR: ____/____/____ (yesterday or 8 days ago)

1. Were the past 7 days typical in terms of your usual pattern of activity or exercise?
   - ☐ Yes → *If yes, confirm the following: So the past 7 days has been representative of the past few weeks?*
   - ☐ No → *If no, ask the following:* Were you more or less active in the past 7 days than you usually are? ☐ More ☐ Less
     If no, determine what week to use to conduct the PAR (i.e. past 7 days or the 7 days before that)
2. Did you sleep the usual amount this week? ☐ Yes ☐ No
3. How many days of the last seven did you work? _____ days (round to nearest day)
4. How many total hours did you work in those _____ days? _____ hours
   (insert answer from Q3)
5. What days of the week do you consider to be your weekend or non-work days? For most people, this would be Saturday and Sunday, but it may be different for you.
   ☐ Sunday ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday
6. If you did not work your usual week, why did you work more/less than usual?

   _____

   _____
7. For the past seven days, and thinking only about activities that are at least of a moderate intensity, how many days did you do activity or exercise that added up to at least 30 minutes each day, if any at all? _____ Number of days (0 to 7)

So now what I want to do is ask you about the times you got in and out of bed for the past 7 days. What I am looking for is the time you physically got in and out of bed, not necessarily the time you fell asleep or woke up.

*Go to table to ask about Sleep and Physical Activity / Exercise for the past 7 days.

		Yesterday										One Week Ago	
	Days of the Week	HRS	MIN	HRS	MIN	HRS	MIN	HRS	MIN	HRS	MIN	HRS	MIN
SLEEP	Night												
	Interrupted (>30 min)												
	Naps/Lie (>10 min)												
MORNING	Moderate		:		:		:		:		:		:
	Hard		:		:		:		:		:		:
	Very Hard		:		:		:		:		:		:
AFTERNOON	Moderate		:		:		:		:		:		:
	Hard		:		:		:		:		:		:
	Very Hard		:		:		:		:		:		:
EVENING	Moderate		:		:		:		:		:		:
	Hard		:		:		:		:		:		:
	Very Hard		:		:		:		:		:		:

***** Are there any other activities that you may have missed?
***** This amount of activity has been typical for you lately?

ID: ☐☐☐☐ Session: Base M1

After table is completed: *Until now, we've just been talking about the last seven days. Now I would like you to think about your usual activities over the last three months.*

8. During your work week, on average how many hours per day do you spend sitting, such as driving, watching TV, working at a desk or computer, eating, or reading? I'm not looking just for the time you spend sitting at work, I'm looking for an entire day that you work, so from the time you get out of bed in the morning until you get back into bed at night. _____ hrs/day

   After answer is given confirm the following: So that includes from when you get out of bed in the morning until you get back into bed at night and includes any driving, meals, etc?

   During your weekend, on average how many hours per day do you spend sitting? Again, this is from when you get out of bed in the morning until you get back into bed at night and includes driving, watching TV, working at a desk or computer, eating, or reading. _____ hrs/day

   After answer is given confirm the following: So that includes from when you get out of bed in the morning until you get back into bed at night and includes any driving, meals, etc?

9. If you had to add together the total minutes you spend walking during the day, how many minutes would that be? Remember, add up your actual walking time and don't add in the time spent just standing. So you may be on your feet a lot, but that doesn't necessarily mean that you are walking. Include your to and from walking and any fitness walking. Don't try to remember every step, just give a general idea of the time spent walking. _____ min/day

   After answer is given confirm the following: So that includes from when you get out of bed in the morning until you get back into bed at night and doesn't include any standing?

10. What is your usual pace of walking? Mark ONE only.

    ☐ Casual or strolling (less than 2 miles per hour)
    ☐ Average or normal (2 to 3 miles per hour)
    ☐ Fairly brisk (3 to 4 miles per hour) * compare to TM walk
    ☐ Brisk or striding (4 miles per hour or faster)

11. Do you do any strength and/or flexibility exercises such as using weight machines, free weights, or exercise bands, doing sit-ups or push-ups, doing yoga or pilates, or stretching, at least 1x/week? * Average over past 3 months

    ☐ Yes
    ☐ No

    If yes, on average how many days per week and minutes per session do you engage in the following exercises? * Average over past 3 months

Type	Days per week	Minutes per session
Strength (i.e. weight machines, free-weights, exercise bands, sit-ups, push ups)		
Flexibility (stretching)		
Yoga/Pilates		
Other _____		

ID: ☐☐☐☐ Sesión: Fecha en que se llenó este formulario: ☐☐ ☐☐ ☐☐

Recordatorio de Actividad Física

Día de la semana en que se llenó el formulario: _____ Fecha del 1er día del recordatorio: ____/____/____

1. ¿Con respecto a su patrón normal de actividad o ejercicio, fue esta una semana típica?
   - ☐ Sí → *Si Sí, favor de confirmar lo siguiente: ¿Diría Usted que los últimos 7 días reflejan las últimas semanas?*
   - ☐ No → *Si No, pregunte lo siguiente:* ¿Estuvo más activa o menos activa en la semana pasada de lo que normalmente está? Más ☐ Menos ☐

   Si No, determine cual semana usar para conducir el PAR (ejemplo: últimos 7 días o los 7 días anteriores)
2. ¿En esta semana, durmió la cantidad de tiempo que normalmente duerme? ☐ Sí ☐ No
3. ¿Cuántos días de los últimos siete días trabajó? ☐ (redondee al día entero siguiente)
4. ¿Cuántas horas en total trabajó en los últimos siete días? _____ ¿días? _____ Horas
   (insert answer from Q3)
5. ¿Cuáles días de la semana considera usted que sean su fin de semana o días libres? Para la mayoría de la gente, esto sería el sábado y domingo, pero podría ser diferente para usted.
   ☐ Domingo ☐ Lunes ☐ Martes ☐ Miercoles ☐ Jueves ☐ Viernes ☐ Sábado
6. Si no trabajó su horario normal en esta semana, ¿por qué trabajó más/menos de lo normal?
   _____
   _____
7. Durante los últimos siete días, y pensando solamente en las actividades que son al menos de intensidad moderada, ¿durante cuántos de estos días hizo usted actividad o ejercicio que sumó al menos 30 minutos en cada día, si es que hizo ejercicio? _____ Número de días (0 a 7)

Ahora le voy a preguntar acerca de los tiempos en que entró y salió de la cama durante los últimos 7 días. Lo que quiero saber es la hora en que Usted físicamente entró y salió de la cama, no necesariamente la hora en que se durmió o se despertó.

* Vaya a la tabla para preguntar sobre el Dormir y la Actividad Física / Ejercicio en los últimos 7 días.

	Días de la semana	Ayer HRS	MIN	HRS	MIN	HRS	MIN	HRS	MIN	HRS	MIN	Hace una semana HRS	MIN	HRS	MIN
DORMIR	Noche														
	Interrumpido (>30 min) siesta/sosn. (>10 min)														
MAÑANA	Moderada														
	Fuerte														
	Muy Fuerte														
TARDE	Moderada														
	Fuerte														
	Muy Fuerte														
NOCHE	Moderada														
	Fuerte														
	Muy Fuerte														

***** ¿Algunas otras actividades que pudo haber olvidado?

***** Esta cantidad de actividad ha sido típica para Ud. últimamente?

2

ID: ☐☐☐☐ Sesión:

(Una vez que complete la tabla) Hasta ahora, hemos estado hablando únicamente de los últimos siete días. Ahora me gustaría que pensara en sus actividades habituales de los últimos tres meses.

8. Durante su semana de trabajo, ¿por promedio, cuántas horas al día se la pasa sentada, tal como el tiempo que pasa manejando un coche, viendo televisión, trabajando en un escritorio o computadora, comiendo, o leyendo? No pregunte solo por el tiempo en que está sentada en el trabajo, pregunte por el día entero cuando Ud. trabaja, eso quiere decir desde la hora en que se levanta en la mañana hasta que entre de nuevo a la cama. _____ hrs/día

Después de recibir la respuesta confirme lo siguiente: ¿Entonces eso incluye desde que Ud. se sale de la cama en la mañana hasta que Usted entra a la cama en la noche e incluye cualquier tiempo manejando, comidas, etc.?

Durante su fin de semana, ¿por promedio, cuantas horas al día se la pasa sentada? Nuevamente, esto es desde que Usted se levanta en la mañana hasta que entre de nuevo a la cama e incluye el tiempo que pasa manejando, viendo televisión, trabajando en un escritorio o computadora, comiendo, o leyendo.

_____ hrs/día

Después de recibir la respuesta confirme lo siguiente: ¿Entonces eso incluye desde que Ud. se sale de la cama en la mañana hasta que Usted entra a la cama en la noche e incluye cualquier tiempo manejando, comiendo, etc.?

9. Si tuviera que sumar el total de los minutos que pasa caminando durante el día, ¿cuántos minutos serían? Recuerde, sume solamente el tiempo que pasa caminando y no incluya el tiempo que pasa parada. Incluya el tiempo que le toma caminar de ida y vuelta a lugares y cualquier caminata de ejercicio. No trate de recordar cada paso, sino una idea general del tiempo que pasa caminando.

_____ total min/día

Después de recibir la respuesta confirme lo siguiente: ¿Entonces eso incluye desde que Ud. se sale de la cama en la mañana hasta que usted entra a la cama en la noche y no incluye el tiempo que esta parada?

10. ¿Cuál es su ritmo/paso usual para caminar? Marque UNO solamente.

☐ Casual o de paseo (menos de 2 millas por hora)
☐ Mediano o normal (2 a 3 millas por hora)
☐ Un poco apresurado (3 a 4 mph) *compare w/TM walk
☐ Rápido o enérgico (4 millas por hora o más)

11. ¿Hace usted algunos ejercicios de fortalecimiento y/o flexibilidad tales como usar maquinas de peso, pesas, o bandas elásticas, abdominales o "lagartijas," yoga o pilates, o estiramientos, por lo menos una vez por semana (Promedio durante los últimos 3 meses)?

☐ Sí
☐ No

12. Si su respuesta es "sí," por promedio, ¿cuántos días por semana y cuántos minutos por sesión usted se dedica a las siguientes actividades?

Tipo (Promedio durante los últimos 3 meses)	Días por semana	Minutos por sesión
Fortalecimiento (maquinas de peso, pesas, bandas elásticas, abdominales, flexión de brazos y pecho o "lagartijas")		
Flexibilidad (estiramiento)		
Yoga/Pilates		
Otro _____		

APPENDIX C

SOCIAL SUPPORT HANDOUTS

What is Social Support?

- Social Support is a group of family, friends, or peers who provide a support network to assist in helping one to achieve personal goals and improve self-image.
- Social support has been shown to increase physical activity.

Examples of Social Support

- Offering encouragement for completing physical activity.
- Go for a Walk with a friend or family member.
- Having someone watch children.
- Offering a ride to the gym.
- Obtaining advice from a Personal Trainer.
- Talking about physical activity progress.

Finding Social Support

- Church Groups
- Friends
- Family
- Work
- School
- Fitness Classes
- Online Fitness Support Networks

Benefits of Social Support

- Become healthier with the support of others.
- Enjoy the company of others during a fun workout
- Help others accomplish their goals.

Tips for Maintaining Social Support

- Have a mutual relationship, where both partners benefit.
- Set realistic goals for physical activity together with a friend or family member. Hold each other accountable for achieving goals.
- Schedule a time with a friend of family member to go for a walk or attend an exercise class together.
- Stay in Touch by sending texts or calling.
- Avoid competition between each other.
- Listen and appreciate Each other.
- Build relationships with people who also want to be active.

Characteristics of Good Social Support

- Positive Attitude
- Encouraging /Motivating
- Helpful
- Good Listener

Social Support

Activities with your Social Support Network

- Meet and walk once a week.
- Attend a free exercise class together at Railroad Park (see list of resources).
- Visit a community gym.
- Go on a hike in the mountains or go for a walk (see list of resources).

Resources

Energize Your Workouts with Social Support
http://www.acefitness.org/article/3112/

Stress Management
http://www.mayoclinic.com/health/social-support/SR00033/NSECTIONGROUP=2

Behavioral and Social Approaches to Increase Physical Activity: Social Support Interventions in Community Settings
http://www.thecommunityguide.org/pa/behavioral-social/community.html

Supporting Others

- Provide social support for others by supporting others as much as they support you to maintain your relationship
- Appreciate others for their help.
- Help you friends set and reach goals for themselves as well.
- Keep friends motivated.
- You can help each other to become healthier and more active!

Que es el apoyo social?

El apoyo social consiste en un grupo de familiares, amigos o compañeros que proporcionan una red de apoyo para ayudar a alcanzar metas personales y mejorar la imagen de sí mismo.

Se ha demostrado que el apoyo social puede aumentar la actividad física.

Ejemplos de Apoyo Social

Dando aliento para hacer actividad física

Salir a caminar con un amigo o miembro de la familia

Alguien quien le cuida los niños mientra usted hace ejercicio

Hablando con amigos o familiars acerca de su progreso de actividad física

Ofreciendo un paseo al gimnasio

Recibiendo consejos de un entrenador personal

Encontrando el Apoyo Social

Grupos religiosos

Amigos

Familia

Escuela o Trabajo

Clases de ejercicio

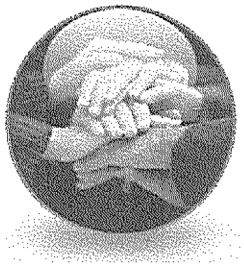
Redes de apoyo fitness (mantenimiento físico)

Beneficios del Apoyo Social

Mejorar su salud con el apoyo de los demás.

Disfrutar de la compañía de los demás durante una divertida rutina de ejercicio.

Ayudar a otros a lograr sus objetivos de actividad física.



Tips para Mantener Buen Apoyo Social

Tengan una relación mutua, donde ambas partes se benefician

Establezca metas realistas para la actividad física junto con un amigo o miembro de la familia.

Planifique una cita para ir a caminar o asistir una clase de ejercicio con familiares o amigos.

Mantenga contacto por medio del envío mensajes de textos, email, o llamadas.

Escuche y aprecie el uno al otro.

Establezca relaciones sociales con personas que también quieren ser activas.

Características de Buen Apoyo Social

Grupos en la Iglesia

Amigos

Familiares

Compañeros de trabajo

Apoyando a Otros

Apoye a los demás tanto como ellos la apoyan a usted para mantener su relación con los que le dan apoyo social.

Aprecie a los demás por su ayuda.

Ayude a sus amigos a establecer y alcanzar sus propios objetivos de actividad física.

Mantenga motivados a sus amigos y familiares.

¡Pueden ayudarse el uno al otro a ser más saludables y más activas!

Actividades para Hacer con su Red de Apoyo Social

Reunanse una vez a la semana para ir a caminar.

Asistan juntas a una clase gratis de ejercicio (vea la lista de clases gratis en Railroad Park)

Visite un gimnasio en la comunidad.

Vaya en una caminata en las montañas o de un paseo (vea la lista de recursos)

Recursos

Energize sus Entrenamientos con Apoyo Social

http://www.acefitness.org/article/3112/

Para Manejar el Estrés

http://www.mayoclinic.com/health/social-support/SR00033/NSECTIONGROUP=2

Intervenciones de Apoyo Social en la Comunidad para Aumentar la Actividad Física

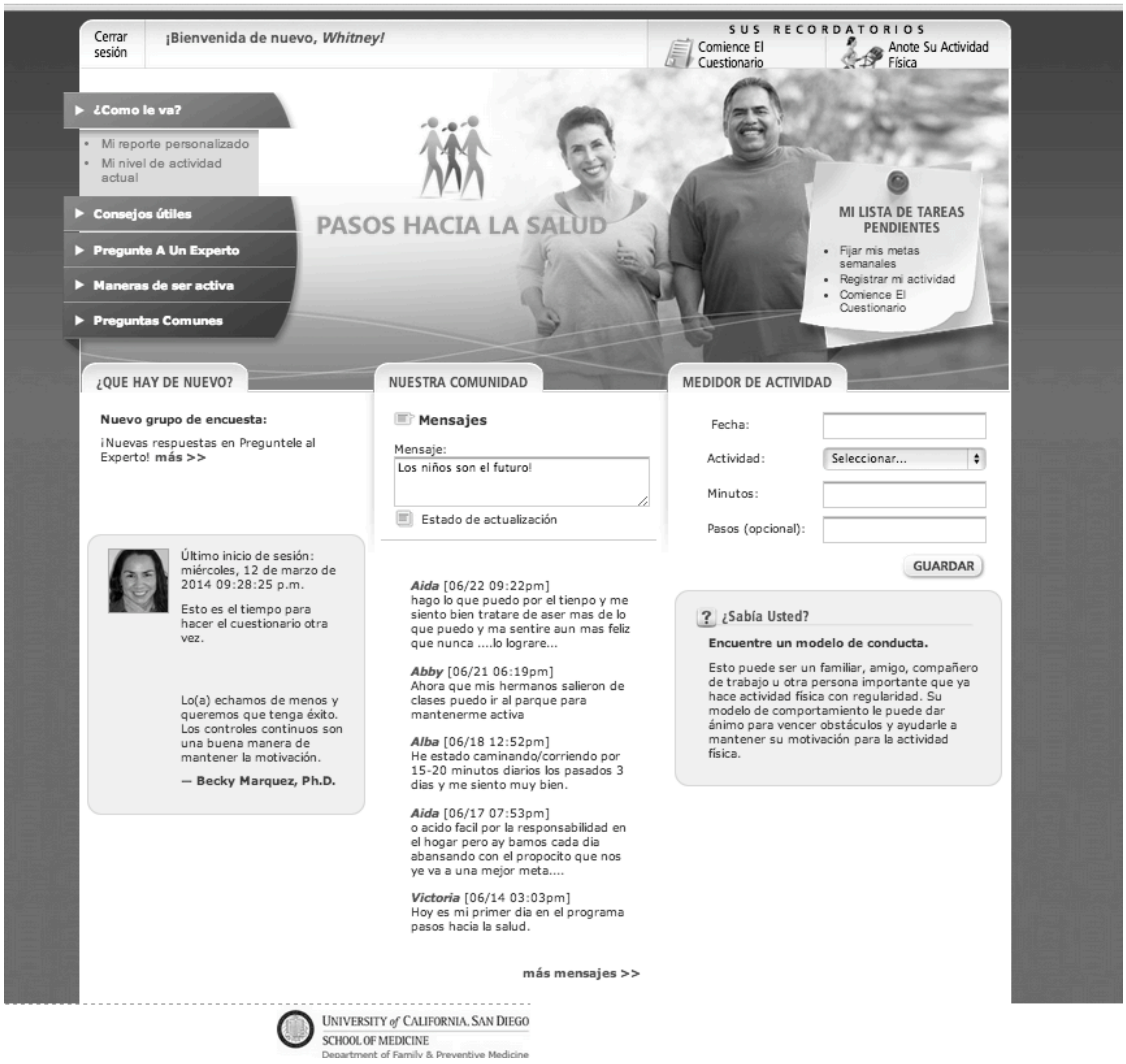
http://www.thecommunityguide.org/pa/behavioral-social/community.html

Apoyo Social

APPENDIX D

WEBSITE SCREENSHOTS

Main Profile Page




Cerrar sesión
Portada
SUS RECORDATORIOS
Comience El Cuestionario
Anote Su Actividad Física
PASOS HACIA LA SALUD
¿Como le va?
Consejos útiles
Pregunte A Un Experto
Maneras de ser activa
Preguntas Comunes
FIJE SUS METAS Y ANOTE SU ACTIVIDAD FISICA
¡¡Nuestros registros indican que usted no ha establecido metas de actividad física o ejercicio la semana pasada. Recuerde que ¡fijar metas es una parte importante para no desviarse!!
Use el calendario de abajo para fijar sus metas semanales de actividad física o ejercicio y para registrar sus actividades cada día. Use las flechas anaranjadas que están arriba del calendario para cambiar el mes. Vea las instrucciones a la izquierda para más información sobre como fijar sus metas y registrar su actividad.
Vea una GRAFICA de su actividad física, y COMPARELA con las metas que ha fijado haciendo clic aquí.
Establezca Sus Metas
Para establecer sus metas semanales, haga clic en la tablilla de la izquierda cada semana para ver la forma en donde escribir sus metas. Solo puede escribir sus metas para esta semana o para las futuras semanas. Cuando fije sus metas semanales, habrá una barra color naranja debajo de cada semana. Puede cambiar sus metas si la semana no ha pasado.
Registrando su Actividad
Para registrar sus actividades, haga clic en una fecha específica en el calendario para ver la forma en donde anotar su actividad. Solo puede anotar las actividades de hoy o de días anteriores. Cuando ha escrito las actividades de un día, un icono aparecerá con el número total de minutos de actividad. Usted puede cambiar las actividades que anoto a cualquier tiempo.
FIJE SUS METAS
marzo de 2014
dom lun mar mié jue vie sáb
23 24 25 26 27 28 1
2 3 4 [50 min.] 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31 1 2 3 4 5