Personal, Social, and Physical Environmental Correlates of Physical Activity Levels in Urban Latinas

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Background: Nationwide, Hispanic women report low levels of physical activity and bear excess health risk associated with inactivity. This study investigated the relationship between physical activity levels and sociodemographic, social environmental, and physical environmental factors.

Design: A cross-sectional, community-based convenience sample of 285 Hispanic/Latino women completed a face-to-face survey administered in Spanish.

Main Outcome Measures: The following categories of physical activity were used in analyses: "meets current national recommendations," which includes women who reported engaging in moderate activity at least 5 days per week for at least 30 minutes or who engaged in vigorous activity at least 3 days per week for at least 20 minutes; "insufficiently active" for women not meeting moderate or vigorous objectives; and "inactive" for women who report no moderate or vigorous physical activity.

Results: The majority of women (46%) were aged 20 to 29 years, 48% have less than or equal to a high school education, 72% are employed, 43% speak Spanish, and 76% are from Central or South America. A total of 37% of the women met physical activity recommendations, 23% were inactive, and 40% were insufficiently active. Personal and physical environmental factors were not statistically significant correlates of activity level comparison groups; however, most indicated trends in the hypothesized direction. Social environmental factors that showed statistically significant relationships with various physical activity comparison groups included the following: Women were significantly less likely to be active if they reported knowing people who exercise (odds ratio [OR]=0.42; 95% confidence interval [CI], 0.23–0.76), reported that there are people in the neighborhood who exercise (adjusted OR=0.19; 95% CI, 0.09–0.42), belonged to community groups (OR=0.32; 95% CI, 0.15–0.69), or attended religious services (OR=0.41; 95% CI, 0.41–0.72).

Conclusion: Social environmental factors appeared to be the most important factors related to physical activity in this group of Latino women. Physical environment and personal factors, although not statistically significant, showed trends in expected directions and should be explored further.

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Hispanics, projected to be the largest minority in the United States by 2010,[1,2] have reported high rates of physical inactivity. Compared with other ethnic/gender groups, Hispanic women (Latinas) are the most likely to report no leisure-time physical activity. According to the Third National Health and Nutrition Examination Survey, 1988–1994 (NHANES III) data, 46% of the Hispanic women reported no leisure-time activity compared with 40% of the African American women, 23% of the white women, 33% of the Hispanic men, and 24% of the African-American men.[3] Hispanics also disproportionately bear excess health risk associated with physical inactivity, such as increased levels of obesity, diabetes, and cardiovascular disease[4–7] and, more recently, breast cancer.[8] Increasing physical activity in minority groups is a leading national priority and yardstick for monitoring the health of our nation in 2010.[9]

Little is known about the theory-based multiple influences that have the potential for informing intervention development that may be specific to minority groups and also common among all groups of women. Physical activity is a complex behavior involving multiple levels of influence, and little is known about the

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unique social, environmental, and personal barriers that young, Hispanic/Latino women experience in the process of adopting or maintaining a regular physical activity program. To our knowledge, no study has investigated urban Latinas and the multiple-level influences on their physical activity. A recent report[10] from focus groups on rural Latina women showed multiple-level themes in the women's social and physical environment that emerged as potential determinants of physical activity. The dominant themes that were mentioned included environmental and policy determinants, such as transportation, lack of facilities, cost, and safety, as well as sociocultural determinants, such as gender roles for activity, spouse support, childcare issues and acculturation.[10]

In this study, we hypothesized that social and physical environmental factors, assessed quantitatively, would be related to physical activity levels in urban Latino women. In particular, we were interested in how social support and barriers caused by social role or social influence and sense of community connectedness and physical environmental factors relate to physical activity levels. A recent review[11] suggested that these factors are important determinants of physical activity for diverse groups of women. A social ecologic approach incorporating social cognitive theory suggests that multiple levels of influence should be considered in a comprehensive intervention approach to increase physical activity in women.[12]

Methods

Instrument

The Women and Physical Activity Survey used in this study was developed on the basis of the results of focus groups. Details of the instrument development are reported elsewhere.[13] The survey items included questions related to the primary factors related to physical activity in women. Content of the survey included sociodemographic status, general health, social environment, physical environment, policy factors, and current physical activity. Physical activity items were based on the Behavioral Risk Factor Surveillance System (BRFSS) survey instrument.[14] That instrument was selected because it is able to differentiate between moderate and vigorous physical activity, is flexible in delivery format, is used in diverse populations, and can be compared with national surveys that have included the BRFSS items. The three-item physical activity measure had an intraclass correlation of 0.7 (95% confidence interval [CI], 0.4–0.9).

Translation of the English version into Spanish was done by the University of North Carolina (UNC) site. Adaptations were made to account for local variations in language. Spanish was spoken by people from Mexican descent (UNC sample) and from Central and South American descent (our sample).

Sample

A convenience sample of 285 urban Latinas aged 20 to 50 years from the two highest prevalence counties in Northern Virginia (Fairfax and Arlington) and the City of Alexandria. There has been a significant increase (14%) in Latinos living in Virginia from 1990 to 2000.[15] Year 2000 census data indicate that the highest concentration of Hispanics or Latinos reside in Northern Virginia (11.4% in Fairfax County, 19.5% in Arlington County, and 14.7% in the City of Alexandria); thus, the participants were sampled from this region. The participants were recruited from April 2002 to September 2002. Women were recruited to complete the survey from a variety of locations, including well-baby public health clinics, churches, community multicultural events, and Northern Virginia social services offices (eligible employees and clients from these organizations were recruited). Women were given a minimal cash incentive for participation in the survey.

Data Collection and Management

Potential participants were approached by trained, bilingual, female interviewers who were in the same age range as the interviewees. Women were asked their age and, if eligible, were asked if they were interested in completing the survey. A description of the project, the types of questions asked in the survey, and an explanation of the survey were given. Eligible women agreeing to participate were read the study consent form in Spanish and were asked if they understood the objectives of the project before signing the form. The survey was conducted in a face-to-face format. However, some women recruited from office settings during work time preferred to complete the survey on their own (<10%). All surveys were checked by data managers for completeness and adherence to skip patterns. A small convenience sample (n=12) was administered the survey after 2 weeks to assess test–retest reliability.

Reliability

To test the reliability of the questionnaire, 12 participants representing the regional group of Latinas were re-interviewed between 7 and 15 days after the first interview, with an average of 12 days (mean, 11.9; standard deviation [SD]=2.8) between interviews. As reported in detail elsewhere[16] for all minority groups, the items administered to this sample had acceptable reliability, with the intraclass correlation coefficients for each question ranging from 0.59 to 0.92 for physical environment, from 0.45 to 0.94 for sense of community, from 0.30 to 0.70 for social issues, from 0.33 to 0.83 for social roles, and from 0.78 to 0.85 for motivation. The intraclass correlation coefficient for the three-item physical activity measure was 0.95 (95% CI, 0.84–0.98).

Statistical Analysis

The analysis plan was collaboratively developed and conducted to be consistent with all of the Women's Cardiovascular Health Network Project sites. Individual items and three scaled variables (social roles, social issues, and sense of community) were analyzed to determine their relationship with physical activity level. Physical activity status was categorized (inactive, insufficient, and meets recommendations) to be consistent with the Centers for Disease Control and Prevention recommendations for physical activity and was based on prior work of Casperson et al.[17] The "meets current recommendations" category included women who reported

Table 1. Personal correlates of physical activity status in 285 urban Latina women aged 20–50 years: the Women and Physical Activity survey, 2001–2002

		Physical activity status	
Correlate	**% (*n*)[b]**	**Meets recommendations (v insuff + inactive) (*n*=106 v 179) OR (95% CI)**	**Meets recommendations + insufficient (v inactive) (*n*=219 v 66) OR (95% CI)**
Age (years)			
20–29	46.0 (131)	1.02 (0.55–1.90)	.65 (0.31–1.35)
30–39	31.2 (89)	1.24 (0.64–2.40)	.78 (0.35–1.74)
40–50	22.8 (65)	1.00 (referent)	1.00 (referent)
Education			
College graduate	14.4 (41)	1.62 (0.80–3.28)	1.02 (0.46–2.30)
Some college	21.7 (62)	1.03 (0.55–1.93)	1.53 (0.72–3.26)
High school/GED	14.4 (41)	1.20 (0.59–2.46)	1.02 (0.45–2.30)
Less than high school	46.3 (132)	1.00 (referent)	1.00 (referent)
Annual income			
≥$35,000	14.0 (40)	0.85 (0.31–2.34)	0.66 (0.28–1.52)
$15,000–<$35,000	54.0 (154)	1.15 (0.60–2.22)	0.99 (0.53–1.86)
<$15,000	15.5 (44)	1.00 (referent)	1.00 (referent)
Employment			
Employed	70.9 (202)	0.49 (0.28–0.88)	.83 (.45–1.53)
Not employed	27.3 (78)	1.00 (referent)	1.00 (referent)
Marital status			
Partner	64.6 (184)	1.43 (0.86–2.38)	0.86 (0.48–1.53)
No partner	33.6 (96)	1.00 (referent)	1.00 (referent)
Number of children			
0	10.2 (29)	1.35 (0.61–2.97)	2.79 (0.81–9.64)
1	23.5 (67)	0.81 (0.45–1.46)	0.95 (0.50–1.80)
≥2	44.6 (127)	1.00 (referent)	1.00 (referent)
General health			
Excellent/very good	46.0 (131)	0.72 (0.40–1.32)	1.04 (0.51–2.12)
Good	30.2 (86)	0.93 (0.49–1.79)	0.78 (0.37–1.64)
Fair/poor	22.4 (64)	1.00 (referent)	1.00 (referent)
Self-efficacy			
Very confident	63.2 (180)	1.33 (0.54–3.28)	2.24 (0.91–5.52)
Somewhat confident	28.4 (81)	0.95 (0.36–2.49)	1.96 (.74–5.18)
Not at all confident	3.1 (9)	1.00 (referent)	1.00 (referent)

Note: Inactive: does not engage in any moderate or vigorous physical activities, insufficient activity: does not meet recommendations for either moderate or vigorous physical activity, meets recommendations: engages in moderate physical activity (five times/week for at least ≥30 minutes/time) or vigorous activity (three times/week for at least ≥20 minutes/time).
[a]Odds ratios (ORs) and 95% confidence intervals (CIs) are adjusted for age, education, number of children, and general health status.
[b]Sample sizes vary because of missing values.
GED, general equivalency diploma.

engaging in moderate activity at least 5 days per week for at least 30 minutes or who engaged in vigorous activity at least 3 days per week for at least 20 minutes.[4]

Because of the dichotomous nature of the physical activity status variables, comparisons were made between activity groups by using logistic regression analyses. Odds ratios (ORs) with corresponding 95% CIs were generated for each variable for each of the combinations of two activity-level comparison groups (meets recommendations versus insufficient and inactive, meets recommendations, and insufficient versus inactive). Logistic regression analyses were adjusted for age, education, number of children, and general health status. The adjusted ORs are shown only when they differ from the unadjusted results (Tables 1–3). Reliability of the questionnaire was determined by a test–retest sample and by comparing the intraclass correlation (ICC) coefficients for each survey question.

Results

Description of Sample

This sample of 287 women had a mean age of 31.9 years (SD=8.4), and 46% were between the ages of 20 and 29 years. Almost one half of the sample (48%) had less than a high school education. Most participants were employed (72%) and had annual household incomes between $15,000 and less than $35,000. The majority had a partner (66%) and two or more children (57%). Most reported "good" to "excellent" general health (77%) (Table 1). The majority of the participants reported that they were born in Central or South America (62%), with the most common country being El Salvador (El Salvador [52%], Honduras [10%], Guatemala [3%]) or South America (Peru [7%] and

Table 2. Social environmental correlates of physical activity in 285 urban Latina women aged 20–50 years: Women and Physical Activity survey, 2001–2002

		Physical Activity Status	
	% (*n*)[a]	Meets recommendations (v insuff + inactive) (*n*=106 v 179) OR (95% CI)	Meets recommendations + insufficient (v inactive) (*n*=219 v 66) OR (95% CI)
Know people who exercise			
Yes	69.8 (199)	0.49 (0.27–0.89)	0.42 (0.23–0.76)
No	25.3 (72)	1.00 (referent)	1.00 (referent)
People in neighborhood exercise			
Yes	77.5 (221)	0.16 (0.06–0.45)*	0.19 (0.09–0.42)*
No	19.3 (55)	1.00 (referent)	1.00 (referent)
Belong to community groups			
Yes	27.4 (78)	0.67 (0.39–1.15)	0.32 (0.15–0.69)
No	67.0 (191)	1.00 (referent)	1.00 (referent)
Attend religious services			
Yes	61.4 (175)	0.60 (0.31–1.13)*	0.41 (0.23–0.72)
No	34.4 (98)	1.00 (referent)	1.00 (referent)
Social issues score (mean)	3.10	0.99 (0.52–1.89)*	0.93 (0.52–1.65)
Social roles score (mean)	2.87	1.14 (0.75–1.74)	0.96 (0.60–1.56)
Sense of community score (mean)	3.24	1.25 (0.78–2.02)	1.70 (0.99–2.90)

Note: inactive: does not engage in any moderate or vigorous physical activities; insufficient activity: does not meet recommendations for either moderate or vigorous physical activity, meets recommendations: engages in moderate physical activity (five times/week for at least ≥30 minutes/time) or vigorous activity (three times/week for at least ≥20 minutes/time).
*Odds ratios (ORs) and 95% confidence intervals (CIs) are adjusted for age, education, number of children, and general health status.
[a]Sample sizes vary because of missing values.

Bolivia [7%]). Most (63%) had lived in the United States for 10 years or less; of those, 68% reported living in the United States for 5 years or less, and 33% reported living in the United States for 1 year or less. The sample was predominately Spanish speaking: A total of 44% reported that they spoke only Spanish, and another 28% reported that they spoke more Spanish than English.

Prevalence of Physical Activity

National recommendations for physical activity were met by 37% of the participants. A total of 23% were inactive (does not engage in any moderate or vigorous physical activities), and 40% were insufficiently active (does not meet recommendations for either moderate or vigorous physical activity).

Personal Correlates

No statistically significant relationships were found between activity level and personal influences. Trends indicate, however, that the women with some college education or who were college graduates were more likely to meet national physical activity recommendations in both comparison groups. Trends indicate that younger (OR=0.65; 95% CI, 0.31–1.35; 20–29 age group) women were less likely to be active (meets recommendations plus insufficient versus inactive) compared with the older (40–50 age category) women. Women who had higher levels of annual household income (≥$35,000) (OR=0.66; 95% CI, 0.28–1.52), were employed (OR=0.83; 95% CI, 0.45–1.53), or were partnered (OR=0.86; 95% CI, 0.48–1.53) were less likely to be active. Women were more likely to be active if they had no children living in the house (OR=2.79; 95% CI, 0.81–9.64). Self-efficacy for exercise, although not significant, showed trends indicating that the very confident (OR=2.2; 95% CI, 0.91–5.52) and the somewhat confident (OR=1.96; 95% CI, 0.74–5.18) were more likely to be active.

Social Environmental Correlates

Many variables showed statistically significant relationships with the physical activity comparison groups. Women were significantly less likely to be active if they reported knowing people who exercise (OR=0.42; 95% CI, 0.23–0.76), if they reported that there are people in their neighborhood who exercise (adjusted OR=0.19; 95% CI, 0.09–0.42), if they belonged to community groups (OR=0.32; 95% CI, 0.15–0.69), or if they attended religious services (OR=0.41; 95% CI, 0.41–0.72). Nonsignificant trends indicate that the sense of community scale was related to activity in both comparison groups. In other words, higher scores (stronger sense of community) were associated with being active in both activity comparison groups. There were no clear trends with the social roles or the social issues scales.

Physical Environmental Correlates

None of the physical environmental influences were significantly related to activity recommendations. How-

Table 3. Physical environmental correlates of physical activity in 285 urban Latina women aged 20–50 years: Women and Physical Activity Survey, 2001–2002

		Physical activity status	
	% (*n*)[a]	Meets recommendations (v insuff + inactive) (*n*=106 v 179) OR (95% CI)	Meets recommendations + insufficient (v inactive) (*n*=219 v 66) OR (95% CI)
Traffic			
Light	11.2 (32)	1.66 (0.70–3.94)	1.36 (0.50–3.66)
Moderate	64.6 (184)	1.31 (0.73–2.36)	1.37 (0.73–2.58)
Heavy	22.4 (64)	1.00 (referent)	1.00 (referent)
Presence of sidewalks			
Yes	75.1 (214)	1.06 (0.59–1.90)	1.00 (0.51–1.96)
No	21.4 (61)	1.00 (referent)	1.00 (referent)
Street lighting at night			
Very good/good	54.0 (154)	0.94 (0.41–2.17)	0.45 (0.12–1.71)*
Fair	35.8 (102)	1.50 (0.64–3.54)	0.63 (0.16–2.47)
Poor/very poor	8.8 (25)	1.00 (referent)	1.00 (referent)
Presence of unattended dogs			
Not much of a problem	63.1 (180)	0.91 (0.54–1.54)	0.79 (0.44–1.41)
Big/somewhat of a problem	31.6 (90)	1.00 (referent)	1.00 (referent)
Safety from crime			
Extremely/somewhat safe	59.3 (169)	1.34 (0.81–2.20)	1.69 (0.82–3.47)
Slightly/not at all safe	37.5 (107)	1.00 (referent)	1.00 (referent)
Places within walking distance			
Yes	62.8 (179)	1.58 (0.64–3.90)*	0.87 (0.31–2.44)*
No	13.0 (37	1.00 (referent)	1.00 (referent)
Places to exercise			
Yes	71.2 (203)	0.56 (0.27–1.17)*	0.54 (0.26–1.11)*
No	22.8 (65)	1.00 (referent)	1.00 (referent)

Note: inactive: does not engage in any moderate or vigorous physical activities, insufficient activity: does not meet the recommendations for either moderate or vigorous physical activity, meets recommendations: engages in moderate physical activity (five times/week for at least ≥30 minutes/time) or vigorous activity (three times/week for at least ≥20 minutes/time).
*Odds ratios (ORs) and 95% confidence intervals (CIs) are adjusted for age, education, number of children, and general health status.
[a]Sample sizes vary because of missing values.

ever, trends indicate that women were more likely to be active (a combination of meets recommendations and insufficiently active versus inactive) (OR=1.36; 95% CI, 0.50–3.66) and meets recommendations if vehicular traffic is light in the neighborhood (OR=1.66; 95% CI, 0.70–3.94). Neighborhoods in which women reported that unattended dogs were not a problem were negatively associated with physical activity (OR=0.79; 95% CI, 0.44–1.41). Women who perceived their neighborhood as safe from crime (either extremely or somewhat safe from crime) were also more likely to be active (OR=1.69; 95% CI, 0.82–3.47). Women who reported having places within walking distance (adjusted OR=0.87; 95% CI, 0.31–2.44) and having places to exercise in their neighborhood (OR=0.54; 95% CI, 0.26–1.11) were less likely to be active.

Interventions

In open-ended questions (Table 4), women noted the primary changes in their community that would facilitate increasing activity levels. The most frequently noted responses were as follows: Improve existing programs and facilities, develop group activities and programs, have more time to exercise, and increase motivation. The following workplace changes most frequently mentioned as helpful in increasing physical activity were having a more flexible schedule, involving employees and employers at physical activity events, recognizing the need for motivation and encouragement, and making physical activity facilities available at work.

Discussion

Unexpectedly, few of the hypothesized variables considered in this study were related to physical activity in young Latinas living in Northern Virginia. These results were surprising, considering that the focus groups with Latinas in North Carolina and among other women with diverse backgrounds indicated that social and physical environmental factors were particularly influential in their physical activity.[13,18–26] It was expected that social environmental and physical environmental factors identified in earlier focus groups would be confirmed in larger samples of women of similar characteristics.

Table 4. Intervention to increase the exercise levels of women: the Women and Physical Activity Survey, 2001–2002

Intervention	Number of women	Quote(s) as an example of the theme
In your community		
Put a gym/place closer for doing exercise with facilities	75	Need a gym or space closer to do exercise.
Develop programs/exercise classes	12	Offer exercise classes, more activities, and programs.
Focus on increasing motivation	31	Create campaigns to motivate them to do more exercise.
Improve on neighborhood environment and security	17	Fix the streets, lights, and sidewalks; increase security.
Providing health information and communication	27	Give information about the benefits if you find time for physical activity.
Women's club/exercise groups and organizations	11	Create a women's walking group, begin a mother's club, and take turns babysitting.
Childcare programs/services	12	Have a daycare center to care for the children.
Develop social support and sense of community	5	Help more communities provide exercise programs.
Increase access to free/low cost facilities	6	Provide cheap programs affordable for poor communities.
Need for park facilities	3	Develop parks with appropriate equipment.
Provide incentives for physical activities	3	Provide incentives for participating exercise.
Assist with language barriers	2	Teach us English.
More time to exercise	23	Dedicate more time for physical activities.
Community is already supportive	4	Everything is ok.
Nothing or I don't know or missing	53	I don't know.
At work[a]		
Flexible working schedule/more break time	55	If I can switch shifts or let out earlier.
Change the nature of work	11	Work less, less pressure from work.
Involve employees/employers at physical activity events	20	Program athletic activities for women of our age, activities that one can directly participate in.
Provide health education at work	11	Have an orientation so we can be explained the significance of exercising.
Have space for physical activity with facilities available on worksite	17	Build a recreation area so we can exercise for a moment.
Already do enough physical activity at work	2	It is ok, our clients live close and can work here.
Need for motivation or encouragement	19	Inviting and creating enthusiasm for exercise for women.
Build support networks among employees/employers	6	Maintain friendships and contact and help each other.
Financial	2	Pay for workers to be member of a gym.
Provide daycare on worksite	1	Put in a daycare.
Nothing, or I don't know, or missing	136	I don't know.

Physical Activity

Although physical activity levels in this sample are higher than in other national studies of Hispanic/Latino women, our study considers total physical activity and not only leisure-time physical activity as other studies have reported.[27] One large study[28] showed that a much higher proportion of women were classified as active when occupational activity was considered to be part of the total physical activity. Although we do not know the specific occupations of the women, domestic and occupational-related activity may account for the higher prevalence of women who meet national recommendations for physical activity.

Correlates of Physical Activity and Suggested Interventions

Personal. Most (87%) of our sample reported one or more children living in the household, and almost one half of the women in the lowest education levels reported walking or performing heavy labor during their workday. These findings suggest that childcare, occupational activity, or both could have been a factor in this sample. The relationship between age, education, annual household income, employment, and activity levels in women is complex and could be related to the idea that young, college-educated, working women with children who may perceive having no time to be active may be more likely to have a sedentary job, whereas less-educated employed women with children may also perceive having less time to be active but are more likely to have active service-type jobs. We report here that lower educational levels are related to walking and performing heavy labor during the workday.

Social environmental factors. Social environmental factors, as others have found,[28–31] were related to activity levels. Women who know people who exercise, belong to community groups, and attend religious services were less likely to be active, whereas women who had a strong sense of community were more likely to be active. Actual community participation may be a higher priority than physical activity. Having a "strong sense of community" is more proximal to the neighbor-

hood (e.g., feelings about neighborhood, neighbors, law enforcement, and neighbor assistance) and could be unrelated to participation in community groups. It also does not require a specific time commitment.

Physical environmental factors. Two physical environmental factors (light traffic and safety from crime) showed trends for positive relationships with meeting physical activity recommendations. We were surprised that perceived access to physical activity resources was not related to physical activity in this study because a recent study[32] has shown a positive relationship with perceived and objective measures of access to facilities and self-reported physical activity. Other studies[33] have found inconsistent results between perceived physical environmental factors and physical activity measures. Our items may have failed in their lack of specificity. Access to resources is complex and involves specific parameters, including proximity, availability (hours of operation), and cost. Other factors, such as how appealing the physical activity resources are to women, and cultural factors could also be important. In addition, low reported access may be related to lack of awareness. We learned anecdotally in conversations with women recruited at one community Latino festival that the women were not aware of a new public community recreation center located directly adjacent to the festival area.

Intervention Suggestions

Women mentioned many possibilities for intervention to increase their physical activity. Among the most prevalent areas open to intervention were the perception of lack of facilities, groups/clubs, personal motivation, and flexible work schedule. It is unclear whether facilities exist in neighborhoods and women are unaware of their location, whether other access factors prevent women from using facilities (e.g., distance, cost, or other cultural barriers), or whether facilities clearly do not exist. More investigation is needed to determine whether facilities exist and whether there is a relationship between specific physical environmental factors, such as a perceived lack of facilities and access, objectively measured facility density, and other access factors.[34]

Intrapersonal factors, particularly motivation and perceived time, were frequently mentioned barriers and have important implications for interventions at the individual level and for workplace policy.

Strengths of this study include the strong foundation of the quantitative survey in which extensive focus groups were conducted in a variety of ethnic groups, including Hispanic immigrants.[13,18–26] The results of the focus groups were the basis for the development of the questionnaire for this study. The relationship between physical activity and multiple-level factors has not been described in a large sample of primarily Central American women. This study did not collect information on refusals; however, interviewers reported that the cash incentives resulted in minimal refusals. The study was a convenience sample of a hard-to-reach minority group. The small total sample size may have contributed to the many nonstatistically significant results.

Conclusion

This is the first study to investigate multiple-level factors that are believed to be influential in physical activity in immigrant women of primarily Central American descent. Although few factors were statistically significant, trends in hypothesized directions were evident. Results of this study further underscore the complex relationship between activity and personal, perceived social and physical environmental factors in urban Latinas. New measures need to be developed, particularly in the physical environmental area, that are specifically linked to the physical activity outcome because other studies have shown physical environmental factors related to walking or biking but not to overall activity.[35]

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