The Association of Physical Activity and Work-Related Characteristics Among Latino Adults

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Background: Studies have examined the association between work-related characteristics and physical activity participation; however few studies include U.S. Latinos. Methods: Six hundred and seventy two Latino adults of San Diego County were randomly sampled and surveyed to assess their health behaviors in the fall of 2006. Analyses were conducted with 633 respondents with physical activity data (94% of sample), examining the extent to which job category and hours worked per week were associated with 4 domains of physical activity defined by MET-minutes per week using the long IPAQ. Results: Multivariate analysis of variance models were computed. After adjusting for covariates, occupational MET-minutes per week were associated with job category and hours worked per week, such that blue collar workers expended more MET-minutes per week than white collar or nonworkers, and those who worked 20 hours a week or less expended less occupational physical activity compared with those who worked more than 20 hours per week. In addition, nonworkers reported expending more household MET-minutes per week than blue collar or white collar workers. Conclusions: Efforts are needed to increase the physical activity levels of Mexican immigrants/Mexican-Americans, with interventions designed in consideration of the individual’s work status.

Keywords: Latinos, job classification, hours worked, exercise

Latinos are currently the largest and fastest growing ethnic minority group in the United States as well as one of the most overweight. Physical activity has been demonstrated to reduce risk for obesity, and meeting guidelines for physical activity is associated with a wide range of physical and mental health benefits. Despite the overwhelming evidence that physical activity is good for one’s health, the percentage of Latino adults from San Diego who report meeting these recommended amounts of physical activity per week (46.1%) is even lower than the national average (48.1%). In understanding physical activity patterns of U.S. Latinos, it is important to consider work status and occupational physical activity.

Research has examined the extent to which work-related characteristics, which typically include job category and hours worked per week (HWPW), are associated with physical activity. One of the most common categorizations of job is blue versus white collar. According to the U.S. Department of Labor, blue-collar workers are defined as manual laborers or workers who perform work involving repetitive operations with their hands, physical skill, and energy. Although white-collar workers’ duties vary significantly within this job category, all fall into 2 broad classifications: professional and managerial jobs, and sales or clerical jobs. As for HWPW, studies do indicate that women are more likely than men to work part time, (fewer than 35 hours per week), although overall, the majority of all those “employed” tend to work 35 or more hours per week.

Studies examining the relationship between work-related characteristics and physical activity have produced inconsistent results. For example, several studies indicated that individuals with higher status jobs or who report working fewer hours per week also report more physical activity. On the other hand, some studies found the opposite for job category and HWPW. Some of these inconsistencies may be explained by where and how these studies were conducted, as they occurred in different countries and each used different methods and measures. Importantly, most of this research has typically included mainly white samples within the U.S. population or have taken place in countries other than the U.S. The few studies that included Latinos reported that those who were employed were less likely to meet physical activity recommendations. One study involved a women-only Latina sample and did not measure job category, but rather employment status (employed versus unemployed), thus limiting conclusions that can be drawn about other dimensions of work. Using data from the third National Health and Nutrition Examination Survey 1988 to 1994 and inclusive of both genders, researchers found that among the Mexican-Americans in the study (26% of total sample of 18,885), blue-collar workers were found to engage in less leisure time physical activity (LTPA)
compared with Mexican-American white-collar workers or their blue-collar Caucasian counterparts.\textsuperscript{15} The large and nationally representative sample of this survey is a major strength; yet it is limited in its examination of physical activity domains to reported LTPA.\textsuperscript{15} Beyond these studies, no studies could be located that reported on the relationship between work-related characteristics and physical activity among Latinos.

The current study examined the association between work-related characteristics, specifically job category and HWPW, and physical activity. Four domains of physical activity were examined in MET-minutes per week using the long IPAQ:\textsuperscript{16} leisure time physical activity (LTPA), occupational physical activity (OPA), transportation physical activity (TPA), and household physical activity (HPA). In interpreting the U.S. Department of Labor’s definitions of blue and white-collar workers,\textsuperscript{6} the physical demands of blue-collar work are expected to be higher than the demands placed on white-collar work. Therefore, in this study, it was expected that the OPA of blue collar versus white collar or nonworkers would be higher. Regarding HWPW, one would expect that the more HWPW, the more OPA one would engage in and the less time one had to be physically active during leisure time. As such, we expected that individuals who reported working more hours per week would engage in more OPA and less LTPA.

**Methods**

**Study Design**

This is a cross-sectional study of self-reported health behaviors of Latino adults in the South Bay region of San Diego County. The San Diego Prevention Research Center (SDPRC) contracted with the Social Science Research Laboratory at San Diego State University to conduct a random digit dial telephone survey with adults who (1) identified themselves as Hispanic or Latino, (2) were between 18 to 69 years, and (3) lived in the South Bay region of San Diego County from July through December 2006. No incentives were provided for participation in this study. The study was approved by the Institutional Review Board.

**Recruitment**

From a random sample of 13,368 household telephone numbers that were within 1 of 5 zip code regions and had a Hispanic surname, 4756 (36%) telephone numbers were invalid (eg, fax machines, disconnected) and 3899 (29%) households were never reached because the telephone line was either busy or no one ever answered, including only an answering machine. From the remaining sample of 4713 telephone numbers, 2418 (51%) were ineligible primarily due to other than Hispanic/Latino ethnicity, 1200 (25%) refused to participate or only completed part of the interview \(n = 379; 8\%), 106 (2\%) spoke a language other than English or Spanish, and 610 (13\%) agreed to participate. An additional 62 interviews were completed using a snowballing technique, in which a second adult in the household completed the interview after the first respondent was finished. Therefore, random-digit-dialing and snowballing yielded a final sample of 672.

**Measures**

Development of the interview guide was based on selection of previously validated and used surveys with the Latino population. The final survey was comprised of 69 questions assessing demographics, employment, health behaviors, health care, and community resources.

The interview questions regarding physical activity were based on the validated 27-item long telephone version of the International Physical Activity Questionnaire (IPAQ), which measures duration, frequency, and intensity of physical activity in the past 7 days.\textsuperscript{16,17} In the IPAQ, 4 physical activity domains are captured: (1) recreation, sport, and LTPA; (2) OPA; (3) TPA; and (4) housework, house maintenance, and caring for family physical activity (HPA). The IPAQ was developed to create a widely-applicable instrument and scoring method for self-reported physical activity to enable more accurate comparability between and within countries.\textsuperscript{16,17} The IPAQ has been translated, accounting for cultural adaptation and conceptual understanding, and is available in several languages, including those used in the current study, English and Spanish.\textsuperscript{8} According to IPAQ guidelines, it is possible to obtain both continuous and categorical measures of physical activity from this long version.\textsuperscript{16,17} Given the self-reported duration, frequency, and intensity of physical activity behavior from the IPAQ, a Metabolic Equivalent-minutes (MET-minutes) score can be calculated in each domain, yielding a continuous variable. METs are multiples of the resting metabolic rate, and are computed by multiplying the determined MET score (based on energy expended) for an activity or intensity by time spent doing that activity (in minutes).\textsuperscript{17} For the current study, a MET-minutes per week score was used to represent one’s physical activity participation in 4 domains. Calculations followed the guidelines created for calculating IPAQ’s responses into MET-minutes per week,\textsuperscript{17} yielding continuous variables for analyses.

Questions specific to work-related characteristics, including job category and hours worked per week (HWPW), were based in part on the 2005 BRFSS survey.\textsuperscript{2} Responses to job category questions were collapsed into 3 categories for the current study analyses: (1) nonworking (unable to work or unemployed or retired, homemaker, or student), (2) blue collar (laborer or service worker or crafts/skilled labor or semiskilled job), and (3) white collar (clerical or managerial or professional or sales job). Those who reported being self-employed were recoded into 1 of the 2 job categories (blue collar or white collar), based on their response to a follow-up question on type of work.

HWPW were measured via an open-ended question, eliciting a response on a continuous scale, as is asked in
the BRFSS survey. Given the wide distribution of HWPW observed in the current study, reported hours were categorized into 5 groups rather than used as a continuous variable: 0 hours per week, 1 to ≤20 hours per week, >20 to <40 hours per week, 40 hours per week, and >40 or more hours per week. For the current study, analyses that used the HWPW variable were only conducted for those respondents who reported being employed in white or blue collar employment.

Several covariates were considered in the models including demographic characteristics and acculturation. Demographic questions were based on the 2005 BRFSS survey, which is available in both English and Spanish. Marital status was dichotomized as married (married or live as married) or not married (divorced, widowed, separated, or single). Education was coded into 3 categories: less than high school, high school graduate/GED, or some college education. Gender, age (continuous), and household size (continuous) were also accounted for in all analyses. As for the final covariate considered, an acculturation score was calculated for each participant based on their responses to 8 of the 12-item acculturation scale for Hispanics developed by Marin, Sabogal, Marin, Otero-Sabogal, and Perez-Stable. Responses to primarily language-based acculturation questions were made on a 5-point scale. An acculturation mean score was computed and used in the current study as a continuous variable, with a higher score representing greater acculturation.

Analyses

All analyses were performed using SPSS version 15.0. Data were screened for outliers and multicollinearity; 2 cases had missing data and 37 had outliers in self-reported physical activity, reporting invalid hours, minutes, or days per week. After filtering these data, a total of 633 cases (94% of recruited sample) were considered in the present analyses. Two multivariate analyses of variance (MANOVAs) were performed exploring the association of the 4 domains of physical activity with the 2 work-related characteristics: job category and HWPW. Several covariates were considered in these models: age, gender, marital status, household size, education, and acculturation. A P-value of <.05 was used to determine statistical significance.

Results

Description of Participants

Descriptive statistics, including demographics, acculturation, and health-related characteristics of the study sample are reported in Table 1. Demographically, this sample was primarily female, married, and had at least a high school education. In terms of acculturation, 59% of the sample completed the interview in Spanish, most were foreign-born (70%) and their acculturation score suggested predominant use of the Spanish language. Differences by job category indicated that blue collar workers were more likely to be male, unmarried, have no more than a high school education, and be foreign born. Figure 1 illustrates no significant differences in the number of HWPW by job category.

Job Category and Physical Activity

It was hypothesized that blue collar versus white collar or nonworkers would report more OPA. The multivariate analysis of variance indicated a significant association

<table>
<thead>
<tr>
<th>Table 1 Demographic and Other Sample Characteristics by Job Category (N = 633)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD) or % (n)</strong></td>
</tr>
<tr>
<td>Mean age (SD)</td>
</tr>
<tr>
<td>% female</td>
</tr>
<tr>
<td>% married</td>
</tr>
<tr>
<td>Median household size</td>
</tr>
<tr>
<td>Educational status</td>
</tr>
<tr>
<td>% completed less than high school</td>
</tr>
<tr>
<td>% completed high school/GED</td>
</tr>
<tr>
<td>% completed some college</td>
</tr>
<tr>
<td>% born in the United States</td>
</tr>
<tr>
<td>Mean acculturation score (SD)</td>
</tr>
</tbody>
</table>

Abbreviations: SD, standard deviation; n.s., not significant.

* Acculturation scores range from 1 to 5 with a higher score indicating more frequent use of the English language.
between job category and physical activity MET-minutes per week adjusting for all covariates \((P \leq .001\); see Table 2). As hypothesized, blue collar workers reported expending more OPA compared with white collar and nonworkers. In addition, nonworkers reported expending more MET-minutes per week in HPA compared with both blue collar and white collar workers. No significant associations were detected between job category and LTPA or TPA.

**HWPW and Physical Activity**

It was hypothesized that the more HWPW would be associated with more OPA and less LTPA. A significant association was observed between OPA and HWPW, after adjusting for several covariates (Table 3); however the relationship was not straightforward. Those who worked 40 hours per week reported engaging in significantly more OPA than those who worked less than 20 hours per week. No other associations were statistically significant.

**Conclusions**

The prevalence of low physical activity among the Latino population has been well established.\(^2\) Research and practice efforts are seeking ways to improve the physical activity levels of Latinos by understanding factors associated with its performance. The current study sought to examine the association between several domains of physical activity measured by MET-minutes per week with the work-related variables of job category and hours worked per week (HWPW).

Consistent with hypotheses, Latino blue-collar workers reported much higher levels of OPA than white collar or nonworkers after adjusting for demographic covariates and acculturation. Blue-collar workers reported 80% more OPA MET-minutes per week than white-collar workers, which is a substantial difference. This is consistent with the definitions of job categories,\(^4\) in which blue collar work tends to be more physically demanding, including “manual labor,” when compared with white-collar work that is generally sedentary. An additional finding was that those categorized as “non-working” (students, homemakers, unemployed) reported more HPA than their working counterparts. This could be explained by the nonworker group having more “free” time to spend at home. These statistically significant associations support the construct validity of the domain-specific scores of the IPAQ, as findings were consistent with expectations.

When measuring the association between HWPW and each domain of physical activity among this Latino sample, the only significant findings were with OPA. Of those included in analyses (blue and white collar workers), those who reported working 40 hours per week also reported more OPA, as measured in MET minutes per week. However, results indicated that variability in LTPA cannot be explained by HWPW. Previously published results with non-Latino samples have been inconsistent, with the majority reporting that the more HWPW, the less LTPA,\(^6,8,10\) while others finding the opposite.\(^7,11\) The present findings suggest that HWPW may not constitute a barrier to being physically active in leisure time among Latinos, as other studies have reported. The common rationale that working full time leads to less leisure time physical activity is not borne out by these results. The nonsignificant associations found for job category and hours-worked per week with LTPA and the significant associations revealed between these work-related characteristics and OPA among Latino adults contribute to understanding activity patterns of this growing segment of the U.S. population. It was somewhat surprising that blue-collar Latinos are about as physically active in leisure...
Table 2  MET-Minutes per Week of Each Physical Activity Domain by Job Category Controlling for Covariates (N = 633)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Total</th>
<th>Nonworkers</th>
<th>Blue collar</th>
<th>White collar</th>
<th>Sig level</th>
<th>Adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity</td>
<td>1041.8 (1436.6)</td>
<td>1037.9 (1347.3)</td>
<td>850.9 (1352.5)</td>
<td>1257.9 (1657.7)</td>
<td>n.s.</td>
<td>.007</td>
</tr>
<tr>
<td>Occupational</td>
<td>3979.1 (6583.2)</td>
<td>676.8 (2711.2)</td>
<td>8991.5 (7986.5)</td>
<td>4961.6 (6489.1)</td>
<td>P ≤ .001</td>
<td>.260</td>
</tr>
<tr>
<td>Transportation</td>
<td>563.2 (1005.4)</td>
<td>650.3 (1046.2)</td>
<td>529.9 (1048.9)</td>
<td>429.5 (853.3)</td>
<td>n.s.</td>
<td>.007</td>
</tr>
<tr>
<td>Household</td>
<td>2780.4 (3174.7)</td>
<td>3192.0 (3480.2)</td>
<td>2239.4 (2810.9)</td>
<td>2566.6 (2811.1)</td>
<td>P ≤ .05</td>
<td>.010</td>
</tr>
</tbody>
</table>

Note. All analyses controlled for age, gender, marital status, household size, education, and acculturation score. Wilks’s Lambda = .727, F = 26.174, P ≤ .001.

Abbreviations: n.s., not significant.

Table 3  MET-Minutes per Week (Standard Deviation) of Each Physical Activity Domain by HWPW Among Blue and White Collar Workers Controlling for Covariates (N = 323)

<table>
<thead>
<tr>
<th>Domain</th>
<th>1 to ≤20 hrs 19% (62)</th>
<th>&gt;20 to &lt; 40 hrs 21% (68)</th>
<th>40 hrs 46% (148)</th>
<th>&gt;40 hrs 14% (45)</th>
<th>Sig level</th>
<th>Adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity</td>
<td>793.6 (962.2)</td>
<td>1007.3 (1758.4)</td>
<td>1012.9 (1610.7)</td>
<td>1321.6 (1503.7)</td>
<td>n.s.</td>
<td>.008</td>
</tr>
<tr>
<td>Occupational</td>
<td>4628.9 (6051.0)</td>
<td>7204.3 (6806.2)</td>
<td>8827.7 (8876.8)</td>
<td>6338.1 (6653.9)</td>
<td>P ≤ .05</td>
<td>.027</td>
</tr>
<tr>
<td>Transportation</td>
<td>649.9 (1067.7)</td>
<td>528.3 (1205.2)</td>
<td>389.4 (657.0)</td>
<td>443.5 (1005.5)</td>
<td>n.s.</td>
<td>.012</td>
</tr>
<tr>
<td>Household</td>
<td>2960.4 (3773.9)</td>
<td>2269.6 (2739.6)</td>
<td>2212.3 (2392.1)</td>
<td>2320.8 (2528.5)</td>
<td>n.s.</td>
<td>.011</td>
</tr>
</tbody>
</table>

Note. All analyses controlled for age, gender, marital status, household size, education, and acculturation score. Wilks’s Lambda = .945, F = 1.45, n.s.

Abbreviations: n.s., not significant.

There are some limitations to the study that need to be acknowledged including potential self-reporting biases and findings based on a single point in time. The sample may not generalize to other Latino/Hispanic subgroups as it is predominantly of Mexican origin. This sample may not generalize to the population in this region as a larger percentage of the sample was women and/or nonworking as compared with U.S. Census Bureau data for this geographic region. The random digit dial list comprised only those using Hispanic surnames and thus was limited. Nevertheless, respondents were screened for Hispanic/Latino ethnicity, ensuring that individuals with a Hispanic surname who were not Latino (e.g., Filipino ethnicity) were not included in the sample. Finally, we did not assess whether the respondents held more than one occupation and the extent to which multiple occupations crossed job categories.

In general, Mexican American and low-education subgroups of the US population suffer from significant health disparities. Thus, one might expect blue-collar Mexican American workers to have particularly low levels of physical activity. A positive finding in the current study is that blue-collar workers had much higher occupational physical activity and similar levels of leisure time physical activity as white-collar workers. This pattern produced higher total MET minutes per week for blue-collar than white-collar workers. However, the prevalence of Mexican Americans meeting physical activity guidelines is less than 50%, and objective accelerometer data indicate fewer than 5% of Latinos and all other race-ethnic groups meet the guidelines. Therefore, increasing physical activity of all U.S. population groups is an urgent public health priority. Population-specific studies, such as the present one, can provide clues about promising intervention approaches. Because it is not feasible to increase OPA in most cases, further increases in LTPA can be pursued for Latinos in any job category. The substantial levels of LTPA for blue-collar workers suggest there is an opportunity to promote more activity in this domain, perhaps motivated by a desire to find an enjoyable way to reduce stress from a physically demanding job.

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References


