Higher Instrumental Activities of Daily Living Disability in Hispanics Compared with Non-Hispanic Whites in Rural Colorado

The San Luis Valley Health and Aging Study

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This study examined Hispanic versus non-Hispanic white patterns of needing assistance with instrumental activities of daily living (IADL). The authors interviewed 798 Hispanic and 614 non-Hispanic white residents of rural Colorado, who were aged 60 years and older between 1993 and 1995. Seventy-five participants were nursing home residents at the time of the interview. Community-dwelling Hispanics were 1.6 times as likely as non-Hispanic whites to need assistance with at least one IADL task (95% confidence interval 1.25-2.13). A larger proportion of disabled non-Hispanic whites were in nursing homes but, after including nursing home residents, Hispanics remained significantly more likely to need assistance on at least one IADL task (odds ratio = 1.49, 95% confidence interval 1.16-1.93). Hispanics were also more likely to have difficulty on observed performance tasks. The Hispanic excess was not removed by adjusting for chronic disease, reported difficulty walking, or income. English language proficiency adjustment lowered the Hispanic excess, but adjusting for years of education or Mini-Mental State Examination scores more completely removed the ethnic differences. Higher education was protective for both Hispanic and non-Hispanic white elderly. Efforts to further investigate what facets or correlates of education are operating may offer useful insights into limiting IADL difficulties in future cohorts. Am J Epidemiol 1998;147:1019-27.

The US Hispanic population grew eight times more rapidly than did the non-Hispanic white population between 1980 and 1990, and future estimates suggest that Hispanics may be the largest minority by the year 2020 (1). Hispanics are an increasingly prominent subgroup of the elderly, yet disability estimates for this minority population are uncommon. Several previous studies considering disability in Hispanics have not had a concurrently measured comparison group (2-4) or have focused on selected subgroups of the elderly, such as persons with dementia or diabetes (5, 6). Mexican-American participants in the 1978-1980 Health Interview Survey were more likely than non-Hispanic whites to report limitations in their activity (46.5 percent vs. 37.6 percent, respectively, aged ≥65 years) (7). Data from the 1987 National Medical Expenditure Survey suggested the opposite pattern, with Hispanics reporting less functional limitations than non-Hispanic whites in analyses that included Hispanics of Cuban and Puerto Rican origin as well as Mexican Americans (8). Haan and Weldon (9) presented data suggesting that Hispanic disability may be more evident among persons with at least two of the chronic illnesses of diabetes, stroke and hypertension. To date, it remains unclear if Hispanics tend to be more disabled and what factors affect their patterns of disability. The disparities and limited data sources encouraged funding of several studies that focus on patterns of Hispanic disability. We report findings from one of these studies, the San Luis Valley Health and Aging Study, which provides population-based contrasts of disability patterns for elderly Hispanic and non-Hispanic whites living in two rural counties of southern Colorado.

Physical functioning is often measured by the ability of elders to perform basic self-care activities (activities of daily living (ADL)) or household chores and errands that facilitate independent functioning (instrumental activities of daily living (IADL)) (10, 11).
We previously found that Hispanic elderly in the San Luis Valley were as likely as non-Hispanic whites to report "any" difficulty with ADL, but Hispanics had a small excess of needing assistance with ADL tasks (Hamman et al., University of Colorado School of Medicine, unpublished manuscript). We report here on the prevalence of IADL dependence to provide contrasts of Hispanics and non-Hispanic whites at this higher level of physical functioning. Ethnic contrasts for observed performance items are also presented, since reported IADL items may be distorted by proxy or language-based response differences. We also selected a limited number of explanatory factors to further explore pattern differences between the ethnic groups.

MATERIALS AND METHODS
Population and sampling
The San Luis Valley Health and Aging Study is a community-based study of health and disability among Hispanic and non-Hispanic white elderly residents of Alamosa and Conejos counties in southern Colorado. These two counties cover about 2,000 square miles (3,200 square km) with a 1990 US Census population of 21,070 (12). In 1992 and 1993, all occupied households were enumerated (97.2 percent response rate). Eligibility requirements included being age 60 years or older, a current county resident, and of Hispanic or non-Hispanic white ethnicity. Hispanic ethnicity was defined by the 1980 US Census question, "Are you of Spanish or Hispanic origin or descent?" (13). Nursing homes in the two counties and all nearby counties were enumerated between December 1994 and February 1995, and persons whose prior home address was in the two-county study area were considered county residents. Differential sampling within age and ethnic strata was required to ensure appropriate numbers of subjects for the planned ethnic contrasts. For both community and nursing home residents, all eligible Hispanics aged 65 years or older were invited to participate as well as 49 percent of persons aged 60–64 years. Among non-Hispanic whites, we sampled 100 percent of persons aged 80 years or older, 58.5 percent of persons aged 65–79 years, and 37 percent of those aged 60–64 years. Overall, 2,067 persons were initially invited to participate in the study. Before completing a visit, 310 persons became ineligible: 171 died before a visit attempt, 125 moved out of the study area, and 14 were ineligible because of inaccurate age or ethnicity. Of the remaining 1,757 persons, 1,433 completed a study visit for a response rate of 81.6 percent. Seventy-five participants were nursing home residents when study visits were completed. The response among nursing home residents was high (91.5 percent) and did not differ by ethnicity (Hispanics, 92.3 percent; non-Hispanic whites, 91.1 percent). Refusers in the community were more likely to be non-Hispanic white (response rate, 78.2 percent; Hispanic response rate, 84.3 percent). Overall, refusers were also less likely to have any reported ADL difficulty and were slightly more likely to be ≥80 years of age. Refusers did not significantly differ from respondents on sex, education, self-rated health, or hospitalization in the past year. Twenty-one of the 1,358 community-dwelling participants were missing data on reported IADL items and are not included in these analyses.

All interviewers were bilingual, and Spanish-translated forms were available, though only 5.5 percent of Hispanics had "Spanish only" interviews. Participants more often "mixed" English and Spanish when selecting non-English options. Cognitive status was measured by Folstein’s Mini-Mental State Examination (MMSE) (14). Participants scoring 18 or higher completed the full protocol. Persons with literacy or vision difficulties scoring between 11 and 17 were evaluated by a trained interviewer, and a limited number judged cognitively capable also completed the protocol. All other participants scoring below 18 completed the examination and selected performance tasks while the primary care giver or closest relative with knowledge of recent functioning and medical history was sought for self-reported items. Proxy responses were used for 14.9 percent of participants and more often for Hispanics (Hispanics, 18.2 percent; non-Hispanic whites, 10.9 percent).

Participants were queried on their medical histories, and a "count of chronic diseases" variable was created using the following disease items: cancer, diabetes, stroke, transient ischemic attacks, arthritis, high blood pressure, Parkinson's disease, lung disease (chronic obstructive pulmonary disease, emphysema, chronic bronchitis), cirrhosis, kidney failure, osteoporosis, seizures, current migraines, current depression, angina, heart failure, heart attack, or cardiac blood vessel surgery.

REPORTED IADL DEPENDENCE
Our IADL question set used the syntax and items chosen for the 1984 National Health Interview Supplement on Aging (15). Participants were asked, "Because of a health or physical problem, do you have any difficulty" with IADL tasks (preparing meals, managing money, and so on). Persons reporting any difficulty further rated their difficulty level as some, a lot, able with help, or unable to do. Possible responses to the initial difficulty questions included "does not do
for other reasons,” and such responses are typically considered nondisabled (16, 17), though this method will underestimate IADL disability slightly (17, 18). We confirmed that varying the methods of treating the “does not do” responses (counting these responses as nondisabled, excluding these responses, counting ADL disabled persons as IADL disabled) did not alter the ethnic contrasts of interest before selecting the common method of counting “does not do” responses as nondisabled for these analyses. IADL disability was analyzed for this report at the level of “needing assistance or unable to do” tasks because of the higher reliability of responses at this difficulty level (11). In selected analyses using “any” difficulty with IADL items as the outcome, Hispanics had similar excess IADL disability (data not shown).

**Observed IADL disability**

Participants also completed observed functioning items from a shortened version of the Structured Assessment of Independent Living Skills (SAILS) (19). Four items were selected for these analyses: counting out money (three amounts; analyzed as all incorrect vs. at least one correct), making change (three trials; analyzed as all incorrect vs. at least one correct), able to manage medications (reading and understanding medication label and able to open at least one of two types of medication containers), and using a standard phone (correctly reading and dialing a phone number).

**IADL and observed performance estimation**

IADL question items were not asked of nursing home residents since nursing home staff complete these tasks. However, non-Hispanic whites were more likely to use nursing home care (see table 1), and excluding nursing home residents could bias results. While it might be reasonable to assume that all nursing home residents require assistance with at least one IADL task, whether residents would require assistance on each of the eight IADL items was less clear. We developed discriminant functions predicting individual IADL outcomes using available community data to estimate the likely IADL responses for nursing home residents. These discriminant functions used ADL functioning, MMSE score, hearing status, and vision status as predictors of needing assistance on IADL tasks. ADL functioning was the strongest predictor and cognitive functioning an additional significant predictor for all eight reported IADL items. Vision status additionally improved prediction of problems with driving, shopping, medication use, and managing finances. Hearing status predicted problems with phone use. Misclassification rates were low in these

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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Community participants (n = 1,337)</td>
<td>74.0</td>
<td>56.8</td>
<td>86.3</td>
<td>74.7</td>
<td>74.7</td>
<td>74.1</td>
<td>58.6</td>
<td>97.4</td>
<td>0.002</td>
</tr>
<tr>
<td>Nursing home participants (n = 176)</td>
<td>74.7</td>
<td>57.6</td>
<td>84.8</td>
<td>84.8</td>
<td>75.1</td>
<td>56.6</td>
<td>97.4</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>All participants (n = 1,412)</td>
<td>74.7</td>
<td>57.6</td>
<td>84.8</td>
<td>84.8</td>
<td>75.1</td>
<td>56.6</td>
<td>97.4</td>
<td>0.042</td>
<td></td>
</tr>
<tr>
<td>Hispanics (n = 798)</td>
<td>74.1</td>
<td>56.6</td>
<td>84.8</td>
<td>84.8</td>
<td>75.1</td>
<td>56.6</td>
<td>97.4</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic whites (n = 614)</td>
<td>75.4</td>
<td>59.5</td>
<td>84.8</td>
<td>84.8</td>
<td>75.1</td>
<td>56.6</td>
<td>97.4</td>
<td>0.002</td>
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</tr>
</tbody>
</table>

*p* value

* Household income missing for 205 participants.

† MMSE, Folstein's Mini-Mental State Examination.

‡ All participants include community and nursing home participants.

§ p value for most significant source of variance in categorical variables, test for age and disease count, and Wilcoxon's rank sum test for MMSE and income.

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models (<12 percent), except for phone use (22 percent misclassified). Not surprisingly, over 90 percent of the 75 nursing home residents were estimated to be disabled for each reported IADL item using these models. These estimated responses for nursing home residents were used only in selected contrasts of Hispanic versus non-Hispanic white disability in the full cohort.

The observational examination of the Structured Assessment of Independent Living Skills was also not completed in nursing homes because of time constraints in the institutional environment; it was also missing for 72 community respondents. In similarly developed discriminant function models, MMSE scores were the strongest predictors for all four observed items, and ADL counts were the second strongest predictor of the money items and using a standard phone. Vision status improved prediction of the money items and the medication item. Misclassification rates in these models were higher than for self-reported items, ranging from 16 to 25 percent.

**General statistical methods**

Prevalence estimates were adjusted for age using direct standardization with the full sample age distribution as the standard. Odds ratios for ethnic contrasts were calculated from logistic regression models with IADL items as the dependent variable (20), using the SAS analysis package (SAS Institute, Inc., Cary, North Carolina). Sex by ethnicity interactions were tested for all models.

**RESULTS**

Participants ranged in age from 60 years to 99 years, with a mean age of 74.7 years. Fifty-seven percent of participants were Hispanic. Table 1 presents selected descriptive data for this cohort. Hispanics in this sample were slightly younger but had similar sex proportions. Seventy-five percent of Hispanic participants reported speaking and understanding English well or very well. Only 11 of the 199 Hispanics with poor English were unable to speak or understand English at all, and four of these were cognitively impaired participants whose proxies rated them as unable to understand or speak Spanish either. Hispanics had lower household incomes, less education, and lower MMSE scores. Non-Hispanic whites had higher chronic disease counts, but the two ethnic groups did not differ in needing assistance walking across a room. Nursing home residents were less likely to be Hispanic, and further analyses confirmed that this univariate pattern was not explained by the slight age differences between the ethnic groups.

As expected, the prevalence of needing assistance on at least one IADL task increased with age for both ethnic groups (figure 1). Hispanics had higher prevalence estimates in all age groups for both men and women, but differences in prevalence were notably higher for Hispanic men aged ≥85 years (p = 0.045) and Hispanic women aged 80–84 years (p = 0.009). No other sex- and age-specific differences were significant, though the number of participants is relatively small in each age-specific cell. Combining men and women, Hispanics less than 80 years of age were 1.35 times as likely as non-Hispanic whites to need assistance on IADL tasks (95 percent confidence interval 0.98–1.86), while Hispanics 80 years or older were 2.62 times as likely (95 percent confidence interval 1.61–4.36).

The age-adjusted prevalence for needing assistance with IADL tasks is provided in table 2 for community-dwelling residents. Nearly 15 percent of Hispanic females in this sample were disabled on five or more IADL items compared with only 2.6 percent of non-Hispanic white males. Hispanic males and non-Hispanic white females were intermediate with 9.9 percent and 6.1 percent, respectively. With adjustment for age and sex, Hispanics were 1.63 times as likely as non-Hispanic whites to need assistance on at least one IADL task (95 percent confidence interval 1.25–2.13), and this excess was higher when assistance was needed on 5–8 IADL tasks (odds ratio = 5.16). For all eight IADL tasks, Hispanics had higher rates of disability than non-Hispanic whites. The Hispanic excess was highest for “taking medications,”

Higher IADL Disability in Hispanics

“managing money,” and “preparing meals” items by point estimates, although confidence intervals for most items are overlapping. Sex by ethnicity interactions were nonsignificant, suggesting that these patterns were consistent in men and women.

The ethnic contrasts in our community sample do not account for the differential pattern of nursing home use by ethnicity. The final column in table 2 provides estimates of the Hispanic versus non-Hispanic white patterns including nursing home residents. Although Hispanics remain significantly more disabled on all IADL tasks, such as light housework, that require moderate excess disability in the combined community and institutional sample.

The age-adjusted prevalence of difficulty with the four observed IADL items selected from the protocol of the Structured Assessment of Independent Living Skills is presented in table 3. Hispanics were 3–5 times as likely as non-Hispanic whites to fail to complete these tasks correctly. With addition of the estimated responses for nursing home residents, the Hispanic odds ratios were consistent in men and women.

<table>
<thead>
<tr>
<th>IADL disability</th>
<th>Prevalence (%)</th>
<th>Hispanic vs. NHW† (odds ratio)‡</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td></td>
<td>Hispanic (n = 340)</td>
<td>NHW (n = 240)</td>
</tr>
<tr>
<td>None</td>
<td>67.4</td>
<td>76.9</td>
</tr>
<tr>
<td>1</td>
<td>10.8</td>
<td>14.4</td>
</tr>
<tr>
<td>2–4</td>
<td>11.9</td>
<td>6.0</td>
</tr>
<tr>
<td>5–8</td>
<td>9.9</td>
<td>2.6</td>
</tr>
<tr>
<td>≥1</td>
<td>32.6</td>
<td>23.1</td>
</tr>
<tr>
<td>Transportation</td>
<td>13.5</td>
<td>6.3</td>
</tr>
<tr>
<td>Shopping</td>
<td>14.3</td>
<td>6.3</td>
</tr>
<tr>
<td>Heavy housework</td>
<td>21.0</td>
<td>13.6</td>
</tr>
<tr>
<td>Light housework</td>
<td>10.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Preparing meals</td>
<td>6.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Using standard phone</td>
<td>13.9</td>
<td>8.9</td>
</tr>
<tr>
<td>Taking medications</td>
<td>14.6</td>
<td>3.7</td>
</tr>
<tr>
<td>Managing money</td>
<td>15.8</td>
<td>4.4</td>
</tr>
</tbody>
</table>

* Prevalence for community-dwelling resident sample.
† IADL, instrumental activities of daily living; NHW, non-Hispanic white.
‡ Adjusted for age and sex.
§ Additionally included estimated responses for 75 nursing home residents.
‖ Numbers in parentheses, 95% confidence interval.

We explored selected explanatory variables for the ethnic differences: two markers more related to physical functioning (number of chronic diseases and reported difficulty walking across a room), a variable indicating the ability to speak and understand English “well” or “very well,” household income, years of education, and MMSE scores. Table 4 displays models for three reported IADL outcomes (shopping, managing money, and taking medications) and two observed IADL outcomes (counting money and managing medications) adding adjustment for the selected explanatory variables. Adjusting for the number of chronic diseases generally increased the Hispanic versus non-Hispanic white odds ratios, while adding “needs assistance to walk across a room” resulted in little change to the estimates. Models adjusting for income similarly explained little of the Hispanic excess. Accounting for English proficiency lowered the Hispanic excess, and adjusting for years of education reduced the odds ratios even further. For the combined estimates of community and nursing homes, all education-adjusted confidence intervals included 1.0, and the highest odds point estimate was 1.5 for the observed task of managing medications. Ethnicity-education interactions were nonsignificant in all models, suggesting that more highly educated participants of both...
TABLE 3. Age-adjusted prevalence* of difficulty with observed instrumental activities of daily living (IADL) by sex and ethnicity and ethnic odds ratios for community sample and estimated for total sample with nursing home residents, San Luis Valley Health and Aging Study, 1993–1995

<table>
<thead>
<tr>
<th>Difficulty</th>
<th>Prevalence (%)</th>
<th>Hispanic vs. NHW (odds ratio)†</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
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<tr>
<td></td>
<td>Hispanic (n = 314)</td>
<td>NHW (n = 228)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty dialing number on standard phone</td>
<td>10.0</td>
<td>7.4</td>
</tr>
<tr>
<td>Misreading medication label or unable to open bottle</td>
<td>16.5</td>
<td>5.7</td>
</tr>
<tr>
<td>Difficulty counting out money (on all three trials)</td>
<td>5.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Difficulty giving accurate change (on all three trials)</td>
<td>8.6</td>
<td>1.9</td>
</tr>
</tbody>
</table>

* Prevalence for community-dwelling resident sample; 53 of the 1,337 community participants in these IADL analyses were missing these observed items.
† NHW, non-Hispanic white.
‡ Odds ratio adjusted for age and sex.
§ Additionally includes estimated responses for nursing home residents and community subjects missing observed items.
¶ Numbers in parentheses, 95% confidence interval.

ethnic groups were less likely to need assistance with IADL tasks. Figure 2 illustrates the similar ethnic patterns of disability within education strata. MMSE adjustment also markedly lowered the odds ratio estimates and in some cases reversed the direction of the estimates, though all remained nonsignificant at \( p = 0.05 \). Although "shopping" was the only more physical IADL item presented in table 4, the patterns of odds ratio changes were similar for the IADL items of housekeeping, meals, and transportation.

DISCUSSION

We found an excess of IADL dependency among Hispanic residents in rural, southern Colorado. Among community-dwelling residents, Hispanics were 2–5 times as likely as non-Hispanic whites to need assistance with IADL tasks. However, a larger proportion of disabled non-Hispanic whites were in nursing homes, and estimates that included nursing home residents suggested a more modest Hispanic excess that was generally less than twofold. Lower nursing home use by Hispanics has been reported in other studies (21, 22), which have suggested that cultural and attitude factors are more strongly linked than function-based factors to lower Hispanic nursing home use. The impact such differential patterns may have on ethnic contrasts of disability is often not considered. Only 5.3 percent of our sample resided in nursing homes, yet this relatively small percentage notably changed the magnitudes of our estimates. If studies are meant to consider the "health care needs for community-dwelling residents," then the larger excess of Hispanic dependency in the community sample is a real need that should be addressed. However, for the larger, descriptive question, "Are Hispanics more disabled?," ignoring these nursing home use patterns will bias estimates.

Non-Hispanic whites in our study had prevalence estimates comparable with those of the 1984 Supplement on Aging for needing assistance with IADL activities: 22.8 percent in the San Luis Valley versus 22.2 percent in the Supplement on Aging (aged ≥65 years and using six IADL items) (16). We found that 5.3 percent of elderly residents were in nursing homes in the two-county study area, which is similar to the National Long Term Care Surveys' estimates of 5.5–5.7 percent (23). Relatively few studies have estimates for Hispanics that can be compared with our results. In analyses reported here, San Luis Valley Hispanics had only slightly lower estimates of "any" IADL difficulty compared with Wallace and Lew-Ting's (2) nationally based Mexican-American sample (47 percent vs. 54.5 percent, respectively; aged ≥65 years and using five IADL items). In the latter study, Cuban Hispanics reported fewer IADL difficulties than Mexican Americans or Puerto Ricans, but there was no non-Hispanic white comparison group. The Health Interview Survey in 1978–1980 reported slightly higher "major activity limitations" for Mexican Americans compared with non-Hispanic whites (46.5 percent vs. 37.6 percent),
TABLE 4. Hispanic versus non-Hispanic white odds ratios for IADL* reported and observed items, adjusted for selected explanatory variables, San Luis Valley Health and Aging Study, 1993–1995

<table>
<thead>
<tr>
<th>Models adjusted for age and sex and additionally adjusted for</th>
<th>Reported outcomes (odds ratio)†</th>
<th>Observed outcomes (odds ratio)‡</th>
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</thead>
<tbody>
<tr>
<td>Needs assistance shopping</td>
<td>Needs assistance managing money</td>
<td>Needs assistance taking medications</td>
</tr>
<tr>
<td>Reported</td>
<td>Estimated‡</td>
<td>Reported</td>
</tr>
<tr>
<td>No. of chronic diseases</td>
<td>2.1 (1.9–4.2)§</td>
<td>2.0 (1.4–2.8)</td>
</tr>
<tr>
<td>Needs assistance walking across room</td>
<td>2.3 (1.5–3.5)</td>
<td>1.8 (1.2–2.7)</td>
</tr>
<tr>
<td>Incomes (dollars)</td>
<td>1.8 (1.2–2.8)</td>
<td>1.5 (1.0–2.3)</td>
</tr>
<tr>
<td>Unable to speak/understand English well</td>
<td>1.7 (1.2–2.6)</td>
<td>1.2 (0.9–1.8)</td>
</tr>
<tr>
<td>Years of education</td>
<td>1.3 (0.8–2.0)</td>
<td>1.0 (0.7–1.5)</td>
</tr>
<tr>
<td>MMSE*§</td>
<td>0.9 (0.6–1.4)</td>
<td>0.7 (0.5–1.1)</td>
</tr>
<tr>
<td>Adjusted for all of the above</td>
<td>1.1 (0.6–2.0)</td>
<td>1.0 (0.6–1.9)</td>
</tr>
</tbody>
</table>

* IADL, instrumental activities of daily living; MMSE, Mini-Mental State Examination.
† Odds ratio for Hispanic versus non-Hispanic white.
‡ Additionally includes estimated responses for nursing home residents and community subjects missing observed items.
§ Numbers in parentheses, 95% confidence interval.
¶ Income missing for 205 participants.

In contrast, Hispanics were less likely than non-Hispanic whites to report difficulty with IADL in the 1978–1980 National Medical Expenditure Survey (12,5 percent vs. 17.5 percent) (8), though lack of age adjustment in their tables could have affected the ethnic patterns (24). Varying regional or Hispanic subgroup patterns may also be due to the different socioeconomic, immigration, and education histories of the populations studied, making generalizations difficult. In our rural population, most Hispanics have resided in the area for generations, and only 35 percent self-identify themselves in the subcategory of Mexican Americans, most preferring the category of Spanish/other Hispanic. This pattern of identification is typical of many parts of the Southwest where Hispanics are not recent immigrants. Markides et al. (25) presented estimates of needing assistance with ADL for Hispanics from five southwestern states based on interviews between 1993 and 1994. Our ADL estimates are remarkably similar (Hamman et al., University of Colorado School of Medicine, unpublished manuscript)

We investigated both reported and observed IADL outcomes in this study. One reason that we included observed IADL outcomes was to limit the effect of differential proxy response. In our study, Hispanics were more likely to have proxy respondents for the IADL questions than were proxy respondents for non-Hispanic whites. Nearly 88 percent of persons with proxy respondents for the IADL had low cognitive function (Folstein's MMSE scores

<18), although frailty, illness, or time constraints were also occasional reasons for using proxy respondents. By contrast, observed performance tasks were completed by participants at all levels of cognitive status. Previous studies have reported high agreement between proxy and subject disability reports, but they have also shown that proxy respondents typically report slightly higher levels of disability (26, 27). The observed tasks allowed us to investigate Hispanic versus non-Hispanic white patterns among participants who span the range of cognitive abilities, many of whom had proxy responses for question items. Bilingual interviewers administered the observed tasks, further ensuring that language constraints would minimally affect performance. The congruent results between the observed tasks and reported IADL in our study offer strength to the finding of Hispanic excess IADL disability in this population.

We investigated several explanatory variables for the IADL ethnic differences: number of chronic diseases, reported needing assistance walking across a room, income, English proficiency, years of education, and MMSE score. Adding adjustment for number of chronic diseases or needing assistance walking across a room generally increased the Hispanic excess slightly. Our finding that chronic disease counts failed to explain the Hispanic excess is congruent with that of Haan and Weldon, who reported that greater Hispanic IADL limitation was “neither confounded nor modified by prevalent stroke, diabetes, or hypertension” (9, p. 395). Similarly, income failed to explain the Hispanic excess in our models. This differs from the finding of Kington and Smith (28), who reported that socioeconomic status markers explained the poorer functional status of Hispanics in their analyses of the 1992 Health and Retirement Survey. While this discrepancy may be due to their stronger “wealth” variable, their functional status score also didn’t include IADL items but rather summarized ADL and other items focused primarily on physical abilities. In our study, adjusting for English proficiency lowered the Hispanic excess, and adjusting for either years of education or MMSE score generally removed the Hispanic excess of needing IADL assistance. Point estimates for the Hispanic excess were highest for the items of money management and medication management that are conceptually the least “physical” components of the IADL (29, 30). The importance of the cognitive elements in IADL has been noted by Barberger-Gateau et al. (31), who predicted incident dementia using four IADL items (phone use, transportation, money, and medication management). While there may be general agreement that cognitive aspects of IADL are strong, interpreting the meaning of the “explanatory” effect of education or MMSE is less clear. Education does not solely mark early learning, but it also correlates with language, income, and lifestyle choices that impact health. Increased education was associated with lower IADL disability in both ethnic groups, suggesting that education was not solely marking English proficiency in this study. While education might also be postulated to affect health care access and use, we have found similar health care use by ethnicity in this population (32).

These results suggest that correlates or components of education apart from language and health care access appear to be operating in this population. MMSE is a marker of current cognitive function, but it is well known that MMSE scores differ by educational status (33, 34), and the similar results for these two variables are not surprising. Further investigations are needed to adequately understand how these general markers are acting as “explanatory factors.” Nevertheless, these current analyses support the body of literature that continues to suggest that higher educational attainment early in life may be associated with beneficial effects on health, cognition, and mortality throughout the later decades of life (33, 35, 36).

The strengths of our study include a concurrently measured non-Hispanic white comparison group, high response rates from a population-based sample, and the availability of both observed performance and self-reported IADL items. Refusers were less disabled and more often non-Hispanic white, suggesting that the reported Hispanic excess was conservative. Like many studies of the elderly, we were limited by the need for proxy respondents, although congruent observed performance patterns suggested that proxy response differences did not account for the general ethnic patterns of this analysis. Interpretations of our findings are restricted to the selected explanatory variables explored in this work, and our analyses could not distinctly separate the effects of correlated factors, such as education and MMSE. Because of the cross-sectional design, temporal patterns between postulated risk factors and IADL could not be discerned, and survivorship bias is a concern in this elderly cohort. Our results should be generalizable to similar Hispanic populations in the Southwest, though generalizing to Hispanics throughout the US is less tenable.

Our results indicated a greater need for assistance with IADL tasks among southwestern Hispanic elderly, and they suggest that communities should ensure that home care and elderly support systems are alerted and sensitive to the needs of this population. Of all our findings, the strength of education in explaining IADL differences may be the most interesting. Educational differences between the ethnic groups are
smaller among the young elderly in our study, and such a continuing trend could eliminate ethnic differences in future cohorts. Examination of incident disability patterns and further exploration of such correlates of education as physical activity, diet, adult reading habits, or other life-style choices may improve our understanding of the factors that influence differing ethnic patterns of disability.

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REFERENCES


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