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Racial and Ethnic Differences in Activities of Daily Living Disability Among the Elderly: The Case of Spanish Speakers

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Abstract

Objective—To compare incident disability patterns across racial and ethnic groups.

Design—Prospective cohort study with 6-year follow-up (1998–2004).

Setting—National probability sample.

Participants—A 1998 Health and Retirement Study sample of 12,288 non-Hispanic whites, 1952 African Americans, 575 Hispanics interviewed in Spanish (Hispanic-Spanish), 518 Hispanics interviewed in English (Hispanic-English), older than 51 years, and free of disability at baseline.

Interventions—Not applicable.

Main Outcome Measure—Disability in activities of daily living (ADL) tasks (walking, dressing, transferring, bathing, toileting, feeding).

Results—Hispanic-Spanish reported disproportionately lower rates of walking disability (standardized rates, 4.31% vs Hispanic-English [8.57%], African American [7.54%], white [7.20%]) despite higher reported Hispanic-Spanish frequencies of lower-extremity dysfunction than other racial and ethnic groups. Across the 6 ADL tasks, the development of walking disability was most frequent among Hispanic-English, African American, and whites. In contrast, Hispanic-Spanish reported dressing as the most frequent ADL task disability while walking ranked fourth.

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Conclusions—Aggregating all Hispanics, regardless of interview language, may be inappropriate. Future research on linguistic group differences in self-reported health outcomes is necessary to ensure that health status measures will be appropriate for use in diverse racial and ethnic groups.

Keywords

Activities of daily living; Hispanic Americans; Rehabilitation

Hispanics currently account for 12% of the United States population and are expected to account for 24% by 2050.[1] This has a potentially large impact on health care resources, because minorities in general and Hispanics in particular are more limited in performing ADLs compared with whites.[2–4]

The NHIS and the HRS are large national surveys that measure prevalence of disability in the American population. The NHIS was first to collect data on Hispanic ethnicity (since 1976); other surveys have followed suit. In such surveys, it has commonly been assumed that a detailed translation of a questionnaire into Spanish is sufficient to capture the meaning of the questions. The implicit assumption is that translation and back-translation into Spanish renders a survey culturally compatible. We now know, however, that language is more than a means of reaching a more diverse population; rather, it is related to acculturation.[5] If translation to Spanish does not adequately capture the meaning of particular health care issues, it could cloud our understanding of the health outcomes measured by these surveys.

To date, few studies have examined the association between acculturation and disability or functional limitations. The studies cited previously consistently found that Hispanics had more frequent and greater onset of functional limitations than whites, however, the major limitation for all of these studies was that they did not separate those that responded to the interview in Spanish versus those that responded in English. A recent study found a difference in health status between those who answered questions in Spanish compared with those who answered them in English.[6] However, that study did not examine differences in functional limitations and ADL disability specifically. In this study, we examine differences in onset of specific ADL limitations of disability based on racial and ethnic differences with a particular focus on English- and Spanish-language use among Hispanics.

METHODS

Data and Study Sample

A prospective cohort from a national sample of community-dwelling U.S. adults included 19,597 respondents aged 51 or over who self-identified as Hispanic or Latino, African American or black, and white or Caucasian interviewed in 1998 (baseline) and biennially through 2004 as part of the HRS. Analyses are restricted to 15,333 respondents free of baseline ADL disability who were alive at the subsequent 2000 interview. Those who died between 2000 and 2004 were censored after death. Excluded by design were those who reported disability at baseline (n=1773), died prior to 2000 (n=724), and those who had a proxy respond to the interview (n=1125), for a total of 3622 persons. Another 642 persons with missing follow-up disability or insufficient baseline information were excluded.

Disability

Following the *International Classification of Functioning, Disability and Health*,[7] disability is defined as inability to perform ADLs. Disability in certain ADL tasks (dressing, toileting, bathing, eating, walking across a room, transferring) expected to last 3 months or more was ascertained from self-reported cannot/do not do, or using help/equipment to perform the task (see appendix 1 for the ADL instrument). This assessment captures chronic dependence in

basic self-care tasks that could jeopardize a person's ability to live independently. The development of ADL disability is identified by the first report of any ADL task disability at a subsequent 2000, 2002, or 2004 interview.

Instrument and Translation

The original English questionnaire was translated into Spanish in order to recruit and interview Spanish speakers. When the HRS surveys began in 1992 they adopted a team translation approach. In this method, a fluent bilingual lead translator translated the source English instrument to the target Spanish language. Then at least 2 different bilingual translators reviewed the translation and note errors and discrepancies. The translators then met with a member of the English instrument design team to discuss modifications to the translation. Last, when the instrument was in its final form, the SRC National Bilingual Interviewing Staff conducted pretests. They found that this procedure, particularly the choice to include HRS experienced bilingual interviewers living in different parts of the United States helps in achieving a translation which had comparable comprehension levels for English- and Spanish-speaking respondents addressed the issue of dialectical variation in the Spanish spoken in the United States (personal communication with HRS office staff, Sep 25, 2006).

Covariates

Baseline (1998) demographic factors included race and ethnicity, age, sex, and living arrangement. We used self-reported HRS race and ethnicity information to classify people into 4 mutually exclusive groups: Spanish-speaking Hispanic (Hispanic-Spanish), English-speaking Hispanic (Hispanic-English), non-Hispanic African American, and non-Hispanic white. We distinguished Hispanic-English from Hispanic-Spanish adults because prior literature[8] suggests persons from different linguistic groups have unique explanatory models for health that may influence conventional disability measures.

Self-reported health factors were assessed at each interview. Chronic physical conditions included arthritis, cancer, diabetes, heart disease, hypertension, pulmonary disease, stroke, and bad vision. Mental health conditions included high levels of depressive symptoms (determined by an abbreviated Center for Epidemiologic Studies Depression score in the upper tenth percentile)[9] and cognitive impairment (assessed by a score of $\leq$8 from a composite score based on the Telephone Interview for Cognitive Status and serial 7's test).[10] Physical limitations were assessed by inability or avoidance in upper-extremity (pushing or pulling large objects, lifting or carrying weights >4.5kg [10lb]) and lower-extremity (walking several blocks, climbing several stairs without rest) tasks.

Health behaviors assessed at each interview consisted of current smoking, current alcohol consumption, weight status, and regular vigorous physical activity. Current smoking was ascertained from a positive response to "Do you smoke cigarettes now?" Alcohol consumption was based on a positive response to the question: "Do you ever drink any alcoholic beverages such as beer, wine, or liquor?" Weight status was determined from weight gain or loss of 10 pounds or more, obesity, and underweight. BMI ([weight (kg)]/[height (m^2)]), calculated from self-reported height and weight, was used to define obesity (BMI$\geq$30kg/m^2) and underweight (BMI <20kg/m^2). Regular vigorous physical activity was ascertained from the report of participation at least 3 times a week over the past 12 months in activities such as sports, heavy housework, or a job that involves physical labor.

Socioeconomic factors assessed at each interview consisted of education, wealth, family income, and health insurance. Education, a measure of human capital, was dichotomized as 12 or more versus fewer completed years of education. For analytic purposes, family income (all sources received by the respondent and spouse/partner during the preceding year) and wealth

(the sum of housing and non-housing assets) were dichotomized using the lowest baseline HRS population-weighted quartiles.[11] If only partial income or wealth information was provided during the interview, dichotomized values were based on imputed estimates developed by the University of Michigan. Health insurance was classified into 4 mutually exclusive groups: any private insurance coverage, Medicaid enrollment, Medicare or other government insurance programs such as Civilian Health and Medical Program of the Uniformed Services, Civilian Health and Medical Program of the Department of Veterans Administration, and the Veterans Administration, without additional Medicaid or private insurance coverage, and no coverage.

Statistical Analysis

The HRS is a national probability sample. All analyses were weighted and adjusted for the complex HRS sampling design.[12,13] Analyses adjusted for potential bias due to missing information and/or nonresponse by handling respondents with completed data as another stage of sampling to obtain adjusted sampling weights, using standard sampling methodology.[14] Baseline comparisons between the demographic, health, and economic characteristics of minority subgroups versus whites use chi-square tests of categorical outcomes and F tests of continuous outcomes. Statistical testing was conducted at a nominal 5% α significance level.

Survival analysis for discrete data was used to analyze racial and ethnic differences in the development of ADL disability.[15] The development of ADL disability was measured in discrete rather than continuous time because ADL disability is monitored only at 2-year intervals (1998–2000, 2000–2002, 2002–2004). A discrete hazard rate modeled the probability of developing disability by the next 2-year interview given a disability-free status and risk profile at the current interview. To be included in the analyses, a person's disability status must be known at the start and the end of a 2-year period. All completed interview pairs (1998/2000, 2000/2002, 2002/2004) from a person prior to death contributed to the analyses. This method specifically accounts for repeated measures on the same individual and uses time-varying covariates (ie, demographic, health, and medical access factors). We used the SAS GENMOD procedure[a] with a complementary log-log link to estimate the discrete hazard model. To account for the complex sampling design, variance was estimated using balanced repeated replication, a form of bootstrapping.[14] HRs and associated 95% CIs estimated from the discrete hazard model were reported.

We used direct standardization rates to calculate adjusted prevalence rates by estimating probabilities of disability from the discrete hazard-rate model for (1) each member of the white reference sample, and then (2) as (hypothetically) a member of the African-American subpopulation, (3) as (hypothetically) a member of the Spanish-speaking Hispanic subpopulation, and (4) as (hypothetically) a member of the English-speaking Hispanic subpopulation.[14]

RESULTS

Baseline characteristics, stratified by racial and ethnic group, are presented in table 1. Our sample of 15,333 respondents was comprised of 3.8% Hispanic-Spanish, 3.4% Hispanic-English, 12.7% African Americans, and 80.1% white. The population was mainly women (54.9%); mean age was 64.7 years. A smaller proportion of Hispanic-Spanish lived alone compared with the general population. Hispanic-Spanish notably reported high depressive symptoms, lower extremity dysfunction, low education, and low income more frequently than other racial and ethnic groups.

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Although Hispanic-Spanish reported lower-extremity dysfunction most frequently across racial and ethnic groups Hispanic-Spanish development of walking disability was the least frequently reported. Table 2 shows the standardized rates of the development of walking disability and other specific ADL disabilities, which control for all table 1 covariates. Hispanic-Spanish reported walking disability significantly less frequently than whites (see table 2, standardized Hispanic-Spanish rate, 4.31% vs whites, 7.20%; HR=.56; 95% CI,.36–.76; HR data not shown), while other minority groups were similar to whites (African-American HR=1.05; 95% CI, 0.82–1.29; Hispanic-English HR=1.23; 95% CI, 0.59–1.86; HR data not shown). Because of the incongruity between the Hispanic-Spanish relative underreporting of walking disability compared to their high prevalence of lower-extremity dysfunction, we examined rates of assistance with walking, including both aid from an assistive device or from an assistant. Hispanic-Spanish received assistance substantially less frequently than Hispanic-English (6.4% vs 12.6%), but they were similar in reporting cannot/do not walk (0.5% vs 0.4%; data not shown). This finding contrasts with dressing disability, where Hispanic-Spanish were as likely as Hispanic-English to receive assistance (12.1% vs 10.3%) or report cannot/do not dress (0.9% vs 0.6%; data not shown). Hispanic-Spanish were more likely to receive help with dressing than with walking compared with Hispanic-English, despite similar frequencies among those who could not/did not do these tasks.

DISCUSSION

This study examines acculturation in relation to disability. We used language of preferred interview as a proxy for acculturation, consistent with other work.[6] Participants who choose to respond in their native language over language of their host country are usually less acculturated.[5] Language barriers may limit integration with the host culture and reduce social acceptance due to being identified as Hispanic.[16] While language does not capture all cultural features, it differentiates 2 distinct populations that may differ in unmeasured factors. Disadvantages stemming from limited educational and occupational choices, and social stress related to poverty may contribute to the greater disability burden experienced by the Hispanic-Spanish group. Finally, cultural psychology theory suggests that everyday concepts are not universal.[17] Language differences can result in distinct paradigms concerning health and illness.[18] The results of this analysis suggest that there may be a linguistic factor that explains the incongruence between high reported lower extremity dysfunction and low reporting of walking disability.

In general, our analysis of the data for whites, African Americans, and Hispanic-English parallels disability literature, which shows a decrease in ability to perform lower-extremity–related ADLs before losing the ability to perform upper-extremity–related ADLs.[11,19,20] In contrast, Hispanic-Spanish underreport walking disability even in the face of more frequent lower-extremity dysfunction. Interestingly, although Hispanic-Spanish were less likely to receive assistance with walking or to use an assistive device, they appeared to receive assistance with other ADLs such as dressing. Members of this group were less likely to live alone than other groups, suggesting they had readier access to assistance. This may suggest that walking and/or walking disability has a distinct valence in Spanish culture which manifests differently in the Hispanic-Spanish population compared to English speakers. Although the Spanish version of the questionnaire was translated and back-translated for meaning, it was not tested for reliability or validity of constructs (personal communication with HRS, Sep 25, 2006).

Study Limitations

Several limitations common to secondary databases may affect our findings. First, we use self-reported data. However, self-reported information is standard in epidemiologic research and its reliability has been documented.[21,22] Second, we recognize that dividing Hispanics into 2

groups based on interview language is a gross distinction of cultural differences. However, even this simplistic distinction is sufficient to identify differences in health outcomes consistent with other literature. Finally, this study addresses the issue of Spanish-language interviews only and cannot be generalized to other languages or racial and ethnic groups.

CONCLUSIONS

It appears that the ADL instrument may not measure walking disability task limitations the same way in Spanish speakers as it does in English speakers. Thus, it may not be appropriate for studies that compare health outcomes in racial and ethnic groups to pool all Hispanics regardless of the language in which they responded to the interview. Future research on linguistic group differences in self-reported health outcomes is necessary to ensure our measures will be appropriate for use in diverse racial and ethnic groups.

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List of Abbreviations

ADLs
: activities of daily living

BMI
: body mass index

CI
: confidence interval

HR
: hazard ratio

HRS
: Health and Retirement Study

NHIS
: National Health Interview Survey

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Appendix

APPENDIX 1: QUESTIONS ON ADLS FROM THE HRS

We need to understand difficulties people may have with various activities because of a health or physical problem. Please tell me whether you have any difficulty doing each of the everyday activities that I read to you. Exclude any difficulties you expect to last less than 3 months.

1.	Because of a health problem do you have any difficulty with walking several blocks?					
	0=No	1=Yes	2=Can't do	3=Don't do	4=Don't know	5=Refused
1a.	Do you have any difficulty with walking 1 block?					
	0=No	1=Yes	2=Can't do	3=Don't do	4=Don't know	5=Refused

2.	Because of a health problem do you have any difficulty with running or jogging about a mile?					
	0=No	1=Yes	2=Can't do	3=Don't do	4=Don't know	5=Refused
3.	Because of a health problem do you have any difficulty with climbing several flights of stairs without resting?					
	0=No	1=Yes	2=Can't do	3=Don't do	4=Don't know	5=Refused
3a.	Do you have any difficulty with climbing 1 flight of stairs without resting?					
	0=No	1=Yes	2=Can't do	3=Don't do	4=Don't know	5=Refused

Table 1

Frequency of Baseline Characteristics Among Participants in the HRS (N=15,333)

Baseline (1998) Characteristics	Hispanic-Spanish (n=575)	Hispanic-English (n=518)	African American (n=1952)	White (n=12,288)
	Population %	Population %	Population %	Population %
Demographics				
Female	54.75	55.72	58.64†	54.48
Age (y)				
51–60	43.73†‡	58.75†‡	45.09†‡	40.42
61–70	33.61	25.39	31.81	28.65
71–80	17.07	13.15	16.69	23.06
81 or older	5.59	2.71	6.41	7.87
Mean age	63.82§	60.87†§	63.59†§	64.99
Live alone	11.81†	21.07	29.36†	23.10
Health factors				
Chronic physical health conditions‖				
% with no physical health conditions	34.89†	31.52	18.93†	27.54
Mean no. of physical health conditions	1.19*§	1.27§	1.64†§	1.33
Chronic mental health conditions				
High depressive symptoms	23.96†	13.97*	12.51†	7.05
Cognitive impairment	16.36†	9.91†	15.09†	3.45
Physical function				
Lower-extremity limitations	27.53*	15.22	17.65†	11.52
Upper-extremity limitations	13.87	10.81	13.12†	8.79
Health behaviors				
Current smoker	17.03	13.58	22.85†	17.12
Current alcohol use	21.97†	31.33	20.53†	36.06
Lack of regular vigorous physical activity	60.14*	51.25	59.30†	50.85
Weight				
Obese	25.59	23.69	32.60†	20.99
Underweight	5.84	2.72*	3.06†	4.85

Baseline (1998) Characteristics	Hispanic-Spanish (n=575)	Hispanic-English (n=518)	African American (n=1952)	White (n=12,288)
	Population %	Population %	Population %	Population %
Economic factors				
Low education (≤11y)	83.50†	41.31†	44.51†	19.65
Low income	60.25†	28.78†	44.61†	17.52
Low wealth	65.08†	43.16†	52.81†	17.56
Health insurance				
Private	26.43†‡	56.53†‡	50.32†‡	64.36
Medicaid	25.20	7.63	13.80	2.48
Medicare/CHAMPS/CHAMPVA/VA	20.35	23.08	25.81	29.12
None	28.02	12.75	10.07	4.05

NOTE. Statistical test of minority group compared with white reference group from chi-square test.

Abbreviations: CHAMPUS, Civilian Health and Medical Program of the Uniformed Services; CHAMPVA, Civilian Health and Medical Program of the Department of Veterans Administration; VA, Veterans Administration.

*Unadjusted $P \leq .05$;

†unadjusted $P \leq .01$.

‡Chi-square test over multiple risk factor categories;

§F test over multiple risk factor categories.

||Includes arthritis, cancer, diabetes, heart disease, pulmonary disease, stroke, and poor or no vision.

Table 2

Cumulative Risk of Age, Sex, Socioeconomic Status Adjusted Disability Onset Over 6 Years of Follow-Up Among 15,333 Aged 51 Years or Older from the 1998 HRS

Race	ADL Item Disability Percentage (95% CI)					
	Walking	Dressing	Bathing	Transferring	Feeding Self	Toileting
Hispanic-Spanish (n=575)	4.31 (2.81–5.81)	7.26 (4.67–9.85)	5.49 (2.89–8.08)	6.27 (3.76–8.78)	6.19 (2.40–9.99)	3.50 (1.77–5.22)
Hispanic-English (n=517)	8.57 (4.94–12.21)	7.11 (4.83–9.40)	5.10 (3.00–7.20)	4.49 (2.35–6.62)	1.35 (0.34–2.36)	2.30 (0.97–3.63)
African American (n=1950)	7.54 (6.04–9.03)	6.00 (4.70–7.31)	6.51 (5.37–7.65)	4.10 (3.02–5.17)	3.02 (2.02–4.02)	2.83 (2.10–3.57)
White (n=12,288)	7.20 (6.66–7.73)	5.36 (4.96–5.75)	5.53 (5.05–6.01)	3.88 (3.43–4.34)	2.38 (2.10–2.66)	1.97 (1.67–2.26)

NOTE. Standardization adjusts for demographic factors (sex, age, living arrangement), health factors (chronic physical health conditions: arthritis, cancer, diabetes, heart disease, hypertension, pulmonary disease, stroke, vision; chronic mental health conditions: high depressive symptoms, cognitive impairment; physical function: lower-extremity limitations, upper-extremity limitations), health behaviors (smoking, alcohol use, exercise, obesity, underweight), and economic factors (education, income, wealth, health insurance).