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Recommended Citation

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Mobility limitations and fear of falling in non-English speaking older Mexican-Americans

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Abstract

Objective—To determine whether older Mexican-Americans who cannot speak and/or understand spoken English have higher rates of mobility limitations or fear of falling than their English-speaking counterparts.

Design—We conducted a cross-sectional analysis of 1169 community-dwelling Mexican-Americans aged 72–96 years from the 2000–2001 wave of the Hispanic Established Population for the Epidemiological Study of the Elderly. Mobility limitations were defined as having a Short Physical Performance Battery score ⩽ 9, and fear of falling by participant report of being

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somewhat, fairly, or very afraid of falling. We determined the rates and odds ratios, for having mobility limitations and fear of falling as a function of English ability in those who were 72–96, <80, and 80 years of age.

Results—Among participants who were unable to speak and/or understand spoken English 85.7% had mobility limitations and 61.6% were afraid of falling, compared to 77.6% and 57.5%, respectively, of English speakers. Before adjusting for covariates, participants who did not speak and/or understand spoken English were more likely to have mobility limitations (odds ratio: 1.7; 95% (CI: 1.3–2.4) but not fear of falling, compared to English speakers. Among those aged 80 years, but not those <80 years, who did not speak or understand English were more likely to have mobility limitations (odds ratio: 4.8; 95% CI: 2.0–11.5) and fear of falling (odds ratio: 2.0; 95% CI: 1.3–3.1).

Conclusion—Older Mexican-Americans who do not speak or understand spoken English have a higher rate of mobility limitations and fear of falling than their English-speaking counterparts.

Keywords

Aging; English; fear of falling; Mexican-American; mobility

1. Introduction

Hispanics are the largest and fastest growing minority in the US and the population of Hispanic older adults is growing faster than that of non-Hispanics (United States Census Bureau 2014). Hispanics are more likely to have a disability than are non-Hispanic whites (Alley and Chang 2007). Among older Mexican ~Americans, the incidence of mobility limitations is increasing faster than among non-Hispanic whites (Seeman et al. 2010). Mexican-Americans have also been shown to have poorer mobility performance than non-Hispanic whites, with this difference accounted for by factors such as age, sex, education, income, body mass index (BMI), and chronic conditions (Quiben and Hazuda 2015).

Older adults with a fear of falling are more likely to fall (Cumming et al. 2000; Friedman et al. 2002; Howland et al. 1993) and have gait abnormalities (Vellas et al. 1997) than those without this fear. Risk factors for fear of falling include age, frailty, a recent fall, and chronic medical conditions (Arfken et al. 1994; Friedman et al. 2002; Kressig et al. 2001; Murphy, Williams, and Gill 2002). In Mexican-Americans, fear of falling is predicted by characteristics such as female gender, poor lower body performance, history of falls, arthritis, hypertension, urinary incontinence, and non-attendance of church (Reyes-Ortiz et al. 2006). Mexican-Americans have also been found to have a similar, or slightly elevated, incidence of falling, compared to non-Hispanics (Schwartz et al. 1999). Factors that place Mexican-Americans at risk for falling include being 80 years of age or older, female, and having chronic conditions such as diabetes, arthritis, and depression (Reyes-Ortiz et al. 2004). It is unknown if this increased incidence is associated with greater fear of falling among Mexican-Americans and how this relates mobility limitations and language.

After English, Spanish is the language most frequently spoken in the home (6.4%) in the US, and only 36.3% of older adults in Spanish-speaking homes speak English very well.

English-speaking Hispanics are often included in research on mobility to obtain a sample that is approximately representative of the general population. However, English and non-English speaking Hispanics do not necessarily have equivalent levels of risk for conditions such as disability and mobility limitations. For example, Spanish speaking, but not English speaking, Hispanic older adults have been found to have a significantly higher incidence of disability in activities of daily living than non-Hispanic whites (Song et al. 2007). Language barriers can contribute to Hispanic older adults having less access to health care (Reyes-Gibby et al. 2007) and being less likely to have a primary care physician (Burgess et al. 2006; Heins et al. 2006). Language may also contribute to a higher prevalence and intensity of pain (Reyes-Gibby et al. 2007), lower likelihood for receiving adequate pain treatment, and lower levels of physical activity (Quiben and Hazuda 2015).

To our knowledge, potential differences in the likelihood for having mobility limitations and fear of falling in English vs. non-English speaking Mexican-Americans have not been examined Therefore, we conducted a cross-sectional study of the inability to speak English, understand spoken English, or both, and the relationship of this inability with mobility limitations and fear of falling among Mexican-Americans in the population-based Hispanic Established Population for the Epidemiological Study of the Elderly (EPESE). Mobility limitation, as measured by the Short Physical Performance Battery (SPPB), has been shown to be predictive of disability, nursing home admission, and mortality (Guralnik et al. 1994, 1995, 2000). We hypothesized that the inability to speak and/or understand English would be significantly associated with mobility limitations and fear of falling. As language ability is unlikely to directly cause mobility limitations or fear of falling we hypothesized that this association would be accounted for by several known risk factors.

2. Methods

2.1. Participants

This study is based on data from the population-based Hispanic EPESE study of Mexican-Americans residing in Arizona, California, Colorado, New Mexico, and Texas who were aged 72 years and older. Details on the methods of this study are described elsewhere (Markides et al. 1997.). We analyzed data from 1169 adults collected during 2000–2001 who gave Informed Consent approved by the local Institutional Review Board. This was the first wave of the Hispanic EPESE that included data collection on fear of falling as well as mobility performance. The Hispanic EPESE was administered in either English or Spanish, according to participant preference. As the risks for mobility limitations (Cummings, Studenski, and Ferrucci 2014) and falls (Reyes-Ortiz et al. 2004) are known to be substantially higher in those older than age 80 we also separately examined those aged 80 years and older ($n = 427$), and those younger than this age ($n = 742$).

2.2. Measures

2.2. 1. Short Physical Performance Battery—Participants performed the SPPB, which consists of usual walking speed, standing balance, and a five-repetition chair stand test (Guralnik et al. 1994). Scores from each component task are scored from 0 to 4 and then summed for a total score ranging from 0 to 12, with higher scores indicating better

performance. The SPPB has been validated with Mexican-Americans (Perkowski et al. 1998). Mobility limitation was defined as an SPPB score 9, which has been shown to be predictive of disability, nursing home admission, and mortality (Guralnik et al. 1994, 1995, 2000; Penninx et al. 2000).

2.2.2. Inability to speak and/or understand English—The inability to speak and/or understand spoken English was measured during baseline interviews (1993–1994) with the questions: (1) In your opinion, how well do you understand spoken English?; and (2) In your opinion how well do you speak English? Possible responses were: (1) not at all; (2) not too well; (3) pretty well; (4) very well. We categorized responses dichotomously as: (a) a response of 'not at all' to either question 1 or 2; or (b) giving responses other than 'not at all' to questions 1 and 2.

2.2.3. Fear of falling—Fear of falling was measured with the question: How afraid are you of falling? Would you say you are: (1) not at all afraid; (2) somewhat afraid; (3) fairly afraid; or (4) very afraid? We categorized responses dichotomously as: (a) not at all afraid; or (b) any other response.

2.2.4. Demographic and health characteristics—Demographic characteristics included age, sex, marital status, years of education, and household income. BMI was calculated as measured weight in kilograms divided by height in meters squared.

2.2.5. Comorbidity—Chronic medical conditions were assessed by a series of questions asking the participant if a physician had ever told them that they had high blood pressure, diabetes, cancer, a disease of the kidney, gall bladder, or liver, osteoporosis, cataracts, glaucoma, heart failure, high cholesterol, arthritis, Parkinson disease, or Alzheimer's disease. The total number of chronic conditions was calculated as the sum of positive responses to all questions. Participants were also asked whether they had fallen in the past year. If they responded that they had, they were subsequently asked if they had fallen 1, 2, or 3 times.

2.3. Statistical analyses

Descriptive statistics were calculated for participant characteristics according to age group using means and standard deviations for normally distributed data. Covariances of adjustment variables were evaluated using Pearson correlation analysis. Separate logistic regression models were then constructed for all participants, and by age group, with mobility category (limitation vs. no limitation) or fear of falling as the outcome measures. Initially, the association of English ability with each outcome variable was examined within unadjusted univariate models for all participants and each age group. Multivariable logistic regression models were then examined with adjustment for age, sex, BMI, MMSE score, marital status, years of education, household income, and number of chronic conditions. Marital status, household income, BMI, and number of falls in the past year were examined as both continuous and ordinal variables in logistic regression models. Inferential statistical analysis was conducted using IBM SPSS software (version 22) using a Type I error rate of 0.05.

3. Results

The mean (standard deviation) age of all participants (N = 1169) was 78.7 (5.0) years and 60% were female. Among all participants 80.3% had mobility limitations and 58.9% had a fear of falling. Participants aged <80 years had a mean age of 75.5 (2.1) years, 59% were female, and they had a mean 2.8 (1.8) chronic conditions. Participants aged 80 years age had a mean age of 84.2 (3.6) years, 61% were female, and they had a mean 2.9 (1.8) chronic conditions. All independent variables had Pearson correlation coefficients <0.40 with each other. Descriptive statistics by age group are presented in Table 1. The results were similar when including marital status, household income, BMI, and number of falls as continuous or ordinal variables. Therefore, odds ratios and Significance levels for these are reported as continuous variables for ease of presentation (Table 2).

3. 1. Pooled analysis of all participants

In the univariate logistic regression modeling of all participants (ages 72–96 years), those who did not speak and/or understand spoken English were more likely to have mobility limitations (odds ratio = 1.73; 95% CI: 1.25–2.40) but not a fear of falling (odds ratio = 1.19; 95% CI: 0.93–1.52), compared to those who could speak or understand spoken English. After adjusting for age, sex, MMSE score, marital status, years of education, household income, BMI, number of chronic conditions, and number of times fallen in the past year, for those aged 72–96 years, the inability to speak or understand English was not associated with mobility limitations (adjusted odds ratio = 1.38; 95% CI: 0.95–2.00) or with fear of falling (adjusted odds ratio = 1.16; 95% CI: 0.87–1.56). This indicated that these covariates accounted for the unadjusted association of language with mobility limitations among the full sample.

3.2. Analysis of participants under the age of 80 years

In those aged <80 years there was no association between English ability and mobility limitations (odds ratio: 1.34; 95% CI: 0.93–1.94) or fear of falling (odds ratio: 0.89; 95% CI: 0.65–1.21). After adjusting for age, sex, MMSE score, marital status, years of education, household income, BMI, number of chronic conditions, and number of times fallen in the past year, for those aged <80 years there was no association between language and mobility limitations (adjusted odds ratio = 1.05; 95% CI: 0.69–1.61) or fear of falling (adjusted odds ratio = 0.95; 95% CI: 0.66–1.37).

3.3. Analysis of participants aged 80 years and over

Those aged 80 years who were unable to speak and/or understand spoken English were more likely to have mobility limitations (odds ratio: 4.80; 95% CI: 2.00–11.50) and fear of falling (odds ratio: 2.01; 95% CI: 1.31–3.08). After adjusting for the covariates, for those aged 80 years the inability to speak and/or understand spoken English was associated with mobility limitations (adjusted odds ratio = 3.80; 95% CI: 1.48–9.76), but not fear of falling (adjusted odds ratio = 1.64; 95% CI: 0.99–2.71) (Figure 1).

4. Discussion

To our knowledge, this is the first study to examine the association of the inability to speak and/or understand spoken English with mobility limitations and fear of falling in older Mexican-Americans. We found that participants aged 80 years and older who were unable to communicate in English had higher rates and were more likely to have mobility limitations and fear of falling than their English-speaking counterparts, prior to adjustment for covariates. Our finding in this older age group supported our first hypothesis that those with a lack of English have higher odds for mobility limitations and fear of falling. This hypothesis was also supported by our finding that participants aged 72–96 years who were unable to communicate in English were more likely to have mobility limitations. prior to adjustment for covariates.

Secondly, we found that the association of English language ability with mobility limitations in those 80 years of age and older was not explained by several other known risk factors. This was contrary to our hypothesis, since we expected the association was most likely due to other factors associated with mobility limitations. Lastly, we found that for Mexican-Americans between the ages of 72 and 79 years the odds for mobility limitations and fear of falling were not elevated in relation to inability to understand and/or speak English.

High prevalence of disability in activities of daily living has been seen previously in Spanish-speaking Hispanic older adults (Song et al. 2007). As mobility limitations can contribute to disability (World Health Organization 2001), the higher prevalence of mobility limitations in non-English speaking older Hispanics may contribute to the high rate of disability in this population. However, in contrast, older adults who responded to the 1998 Health and Retirement Study in Spanish had lower prevalence of walking disability than Hispanics who responded in English or non-Hispanics (Tirodkar et al. 2008). However, that study did not exclusively sample Mexican-Americans and examined the language of research participation, which is different than the ability or inability to speak English.

The present findings demonstrate that clinicians should be aware that non-English speaking older Mexican-Americans may have a higher need for rehabilitative care for mobility limitations and fear of falling. Public policy and health care planning should address the growing need for rehabilitative care as the number of Hispanic older adults with mobility limitations continues to increase rapidly (Seeman et al. 2010; United States Census Bureau 2014). The inability to understand and speak English is almost certainly not causal for mobility limitations and fear of falling. Rather, the present findings suggest that older Mexican-Americans who are unable to speak or understand spoken English may have other characteristics that increase their likelihood for mobility problems and being afraid of falling.

Language ability was likely a marker of some other risk factor(s) that we did not address in our analysis. This unknown factor(s) may differ between Mexican-Americans who are aged 80 years and older vs. those less than 80 years of age as the former, but not the latter, were more likely to have mobility limitations. Examples of potential causal factors are lower access to health care, a higher prevalence of pain, lack of pain treatment, strength deficits,

and low levels of physical activity. Future research, such as Structural Equation Modeling, is needed to tease apart the potential causes of higher mobility limitation prevalence in Hispanic older adults who do not speak English.

A strength of the present study is that this was a large population-based cohort of Mexican-Americans from across several states in the Southwestern US. A limitation is that, as a cross-sectional analysis, the results cannot be used to infer cause and effect. These findings would need to be confirmed using a longitudinal approach. Another limitation is that the findings cannot generalize to Hispanic populations other than Mexican-Americans. However, the sample sizes were adequate to evaluate the study question. Finally, the present study is a secondary data analysis and the original study was not powered for this analysis.

In summary, we found that, without adjustment for covariates, Mexican-Americans aged 72–96 years of age who were unable to speak and/or understand spoken English were more likely to have mobility limitations than their counterparts who could communicate in English. Those 80 years and older who could not communicate in English were more likely to have mobility limitations and fear of falling, without adjustment for covariates. The association with mobility limitations was significant even after adjusting for several covariates that may contribute to mobility limitations. Non-English speaking older Mexican-Americans have a higher likelihood for needing rehabilitative care for mobility limitations and fear of falling than those who speak English. These findings highlight the need for accessible rehabilitative care for Hispanic older adults, given the growing population of Hispanic older adults in the US (United States Census Bureau 2014), and the rapidly increasing incidence of mobility limitations among this population (Seeman et al. 2010).

Acknowledgments

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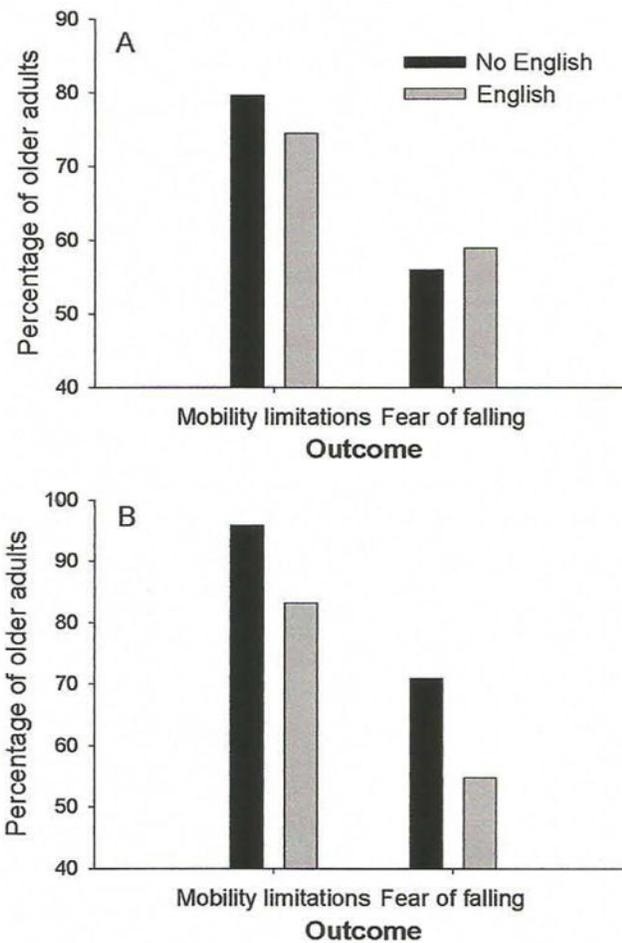
Figure 1.
Unadjusted percentage of Mexican-American adults aged: (a) <80 years; and (b) 80 years; with mobility limitations or fear of falling, as a function of English ability. No English = unable to speak or understand spoken English; English = able to speak and understand spoken English.

Table 1

Descriptive statistics for the Hispanic EPESE participants included in analysis of the collapsed, <80, and 80 year age groups.

Continuous variables	72–96 years (N = 1169) Mean±SD	<80 years (n = 742) Mean±SD	80 years (n = 427) Mean±SD
Age (years)	78.7 ± 5.0	75.5 ± 2.1	84.2 ± 3.6
BMI (kg/m²)	28.0 ± 5.4	28.7 ± 5.6	26.8 ± 4.8
No. of chronic conditions	2.8 ± 1.9	2.8 ± 1.8	2.9±1.8
Years of education	5.0 ± 3.9	5.1 ± 4.0	4.8 ± 3.8
MMSE score	22.4 ± 53	23.2 ± 4.8	21.0 ± 5.9
Categorical variables	%	%	%
No English	34.0	33.7	34.7
SPPB score 9	80.3	76.1	87.6
No English	85.7	79.6	95.9
English	77.6	74.4	83.2
Any fear of falling	58.9	58.0	60.4
No English	61.6	56.0	70.9
English	57.5	58.9	54.8
Female	60.1	59.3	61.6
Marital status			
Married	50.3	56.9	38.9
Separated	2.2	2.8	1.2
Divorced	3.8	3.8	3.7
Widowed	39.9	33.0	52.0
Never married	3.8	3.5	4.2
Household income			
$0–$4999	5.8	5.1	7.0
$5000–$9999	43.6	41.4	47.5
$10,000–$14,999	25.6	26.7	23.7
$15,000–$19,999	12.5	12.7	12.2
$20,000–$29,999	9.0	9.7	7.7
$30,000 & over	3.5	4.4	1.9
No. of times fell past year			
0 time	69.5	71.4	66.0
1 time	17.6	16.7	19.2
2 times	6.5	5.8	7.7
3 times	6.4	6.1	7.0

BMI, body mass index; CV, coefficient of variation; Max, maximum; Min. minimum; SD, standard deviation; MMSE, Mini-Mental State Exam; SPPB, Short Physical Performance Battery.

Table 2

Relationship between English language ability and other characteristics with likelihood of having mobility limitations and fear of falling in Mexican-Americans aged 72 years and older according to age group.

Measure	72–96 years (N = 1169)		Aged <80 years (n = 742)		Aged ≥80 years (n = 427)	
	Mobility limitations OR (95% CI)	Fear of falling OR (95% CI)	Mobility limitations OR (95% CI)	Fear of falling OR (95% CI)	Mobility limitations OR (95% CI)	Fear of falling OR (95% CI)
Unadjusted models						
No English	1.73 (1.25–2.40)	1.19 (0.93–152)	134 (0.93–1.94)	0.89 (0.65–1.21)	4.80 (2.00–11.50)	2.01 (1.31–3.08)
Models adjusted for additional characteristics[a]						
No English	1.38 (0.95–2.00)	1.16 (0.87–1.56)	1.05 (0.69–1.61)	0.95 (0.66–1.37)	3.80 (1.48–9.76)	1.64 (0.99–2.71)
Age	1.08 (1.04–1.12)	1.03 (1.00–1.06)	1.05 (0.97–1.15)	1.13 (1.05–1.22)	1.02 (0.93–1.12)	1.03 (0.97–1.09)
Female sex	1.63 (1.17–2.27)	2.16 (1.64–2.83)	1.27 (0.87–1.86)	1.98 (1.42–2.78)	3.84 (1.85–7.95)	259 (1.61–4.19)
Marital status	1.05 (0.94–1.17)	1.06 (0.97–1.16)	1.02 (0.90–1.16)	1.09 (0.97–1.22)	1.06 (0.84–1.33)	1.02 (0.87–1.19)
Years of education	0.99 (0.95–1.03)	1.02 (0.98–1.06)	0.97 (0.92–1.02)	1.02 (0.97–1.06)	1.05 (0.96–1.14)	1.02 (0.96–1.09)
Income	0.97 (0.86–1.10)	1.08 (0.97–1.20)	0.99 (0.86–1.14)	1.06 (0.93–1.20)	0.92 (0.70–1.20)	1.11 (0.92–134)
BMI	1.04 (1.01–1.07)	1.03 (1.00–1.05)	1.05 (1.01 – 1.08)	1.03 (1.00–1.06)	1.01 (0.94–1.09)	1.03 (0.98–1.08)
MMSE	0.94 (0.91–0.97)	0.97 (0.96–1.01)	0.96 (0.92–1.00)	1.01 (0.98–1.05)	0.91 (0.85–0.97)	0.95 (0.91–0.99)
No. of chronic conditions	1.15 (1.05–1.26)	1.14 (1.07–1.23)	1.15 (1.1 0–1.28)	1.15 (1.05–1.26)	1.14 (0.93–139)	1.16 (1.02–131)
No. of falls	1.07 (0.88–130)	1.43 (1.22–1.69)	1.15 (0.91–1.45)	1.42 (1.16–1.75)	0.86 (059–1.26)	1.41 (1.08–1.84)

BMI, body mass index; CI. confidence interval; No English, inability to speak or understand spoken English; MMSE, Mini-Mental State Exam; OR, odds ratio.

[a] Adjusted models adjusted for age, sex, marital status, years of education, household income, body mass index. Mini-Mental State Exam score, number of chronic conditions, and number of times fallen in the past year.