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The Effect of Acculturation on Frailty among Older Mexican Americans

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Abstract

Objective—To determine the effect of acculturation on the likelihood of becoming frail and pre-frail over a 10 year period among older Mexican Americans.

Methods—A sample of 2,049 Mexican Americans aged 67–108 was analyzed. Adjusted for sociodemographic variables and health, longitudinal multinomial mixed models examined the effects of English language proficiency and frequency of contact with Anglo Americans on deceased, non-frail, pre-frail, and frail statuses.

Results—Greater English language proficiency was associated with a 10 percent reduced likelihood of becoming pre-frail ($p < 0.05$) and marginally associated with becoming frail (relative risk=0.88 $p = .07$) over time. More frequent contact with Anglo Americans was associated with a reduced likelihood of becoming frail (relative risk=0.87; $p < 0.05$).

Conclusions—Among older Mexican Americans, increased acculturation was protective of transitioning from a non frail or prefrail state to a frail state over time suggesting that acculturation may help Mexican Americans cope with health issues in old age.

Keywords

Syndrome; Frail Elderly; Hispanic Americans

An increasingly prevalent syndrome in geriatric populations, frailty, is a largely ignored, but relevant public health issue. Frailty in older adults is characterized by increased weakness, unintentional weight loss, slow movement, a lack of energy, and low levels of physical activity (Fried et al, 2004). With current nationwide attempts to lessen the population's burden on the healthcare system and to decrease costs, prolonged (and costly) periods of disability and/or frailty can seriously pressure a weakened healthcare system (The Board of Trustees, 2009). In addition, with increasing numbers of older ethnic adults, particularly the rapidly growing Mexican descent population, there is no research currently available on the prevalence of or impact of frailty among minority groups on the US health care system.

In order to further advance the study of compression of morbidity (Fries 2005) with regard to the frailty syndrome, longitudinal research is necessary to determine potential precursors to prefrail or frail states. There have been several studies that have examined modifiable characteristics with respect to frailty. For example, Ostir and colleagues (2004) discovered that increased positive affect was associated with decreased risk of frailty in older Mexican Americans (Ostir et al, 2004). In addition, Gill and colleagues (2006), in a study of transitions between different frailty conditions, suggested that there are “ample” opportunities for prevention of transitioning into a frail state.

An additional variable that is potentially modifiable that some evidence suggests is health protective is acculturation (Abraido-Lanza et al, 2006). Recently, in an attempt to untangle the relationship of acculturation to health status, Gonzalez and colleagues (2009) suggested that the negative connection between increased acculturation and worse health found in younger Mexican Americans may not remain negative later in life. The reasoning behind this assertion was that increased acculturation may bring with it a greater ability to navigate the health care system, accumulate assets (both knowledge-based and physical), and adapt to personal health needs (Gonzalez et al, 2009). This has already been shown in a study from the Asset and Health Dynamics of the Oldest Old (AHEAD) where acculturation, as measured by length of time in the United States, mediated the negative association between immigration and instrumental activities of daily living (IADL) as well as health care insurance (Lum et al, 2009). Because difficulties in IADL precede or be preceded by frailty, it is logical to suggest that acculturation may also be positively associated to frailty in older adults.

In order to address the effects of acculturation on frailty, we examined the effects of two acculturation measures on the likelihood of becoming pre-frail and frail over a 10-year period among older Mexican Americans residing in the Southwest. Our hypothesis was that increased proficiency in English and increased contact with Anglo Americans would be protective against becoming frail over time.

Methods

Data were from the Hispanic Established Populations for Epidemiologic Study of the Elderly (HEPESE), a data set representative of 85% of older Mexican Americans aged 65 and older residing in the Southwestern US. These data have been described in detail elsewhere (Markides et al, 1999). The original HEPESE sample included 3,050 participants at baseline (1993–1994) who were interviewed in their home in their preferred language by trained interviewers. For the purposes of the current research, we used data beginning in the second wave of the study (1995–1996) because that wave included the variables necessary to create the frailty index. Our total sample at baseline included 2,049 participants aged 77 and older who were interviewed in person and without a proxy respondent.

Measures

Frailty status was characterized by the participants' score on an index based on frailty criteria outlined by Fried and colleagues (2001) and included measures of weight loss, exhaustion, grip strength, physical activity, and walking speed. Participants received one point for 1) having 10 pounds or more of unintended weight loss since their last interview, 2) responding “a moderate amount of time” or “most of the time” in the previous week feeling like everything they did was an effort or that they could not get going (items from the Centers for Epidemiologic Study-Depression Scale (Radloff, 1977) indicating exhaustion), 3) being unable to perform or scoring in the lowest 20% on grip strength using a hand-held dynamometer (adjusted for body mass index and gender), 4) scoring in the lowest 20% of the Physical Activity Scale for the Elderly (Washburn et al, 1999) (adjusted for gender), or 5) scoring in the lowest 20% on a 16-foot timed walk (adjusted for height and gender). Frailty was categorized as 0 points=non-frail, 1–2 points= pre-frail, and 3–5 points=frail.

Acculturation is measured in many ways in social-epidemiological literature. The measures available in the study were self – assessed proficiency English language and frequency of contact with Anglo-Americans. These two measures were derived from an acculturation scale created by Hazuda and colleagues (1988) specifically designed for Mexican Americans. The purpose of the scale was to capture dimensions of acculturation including

dominant language, cultural values and attitudes, and contact with the mainstream society. Through factor analysis, two distinct subscales were created and have been previously described as valid and reliable (Chiriboga, 2004). The sub-scale measuring English language use consists of self-rated proficiency in reading, writing, understanding, and speaking English, frequency of English use with children, friends, neighbors, and family, and self-reported use of television or radio programs in English. This scale ranged from 0–36 with lower values indicating less English used.

The sub-scale that measured contact with Anglo-Americans was comprised of questions about the ethnic composition of the friends and neighbors of the respondents (mostly Mexican/Mexican-American, mostly Anglo-American, or an equal mixture of both). This scale ranged from 0–4 with 0 indicating contact with mostly Mexican Americans and 4 indicating contact with mostly Anglo Americans.

Multinomial mixed models were used to assess the effect of acculturation on becoming frail, pre-frail, and dead compared to remaining not frail while adjusting for other covariates. Marital status (married or not married), and chronic conditions (count of comorbid conditions including heart attack, stroke, arthritis, cancer, hip fracture, or diabetes ranging from 0–6) were included. Other covariates included continuous age (range 67–108 at wave 2 – this study's baseline), gender, years of schooling (continuous) (range 0–20).

The effect of acculturation on becoming pre-frail and frail was tested in two separate models. We first examine the effect of language proficiency on becoming frail and pre-frail, and, second, we evaluate the effect of Anglo contact on becoming frail and pre-frail. Both models included the demographic variables and co-morbidities.

The models were run using the GLLMM (Generalized Linear Latent and Mixed Models) procedure in STATA 10mp (StataCorp, 2008). GLMM uses maximum likelihood and adaptive quadrature in an iterative process to generate parameter estimates. The random effects (in this case intercepts) are assumed to be correlated only within the same level, not across levels. These models include 10 quadrature points in the estimations.

Results

Descriptive results of the sample by frailty status can be found in Table 1. Those who were frail tended to be older, not married, male, have lower English language proficiency and less contact with Anglo Americans than those who were pre frail or not frail.

Tables 2 and 3 show the results of multinomial mixed models predicting the effect of English language proficiency and contact with Anglo Americans, respectively, on becoming pre-frail and frail compared to not frail. In addition, the models account for respondents who died. As seen in Table 2, greater English proficiency was significantly negatively associated with becoming pre-frail (relative risk=0.90; 95% Confidence Interval=0.83–0.98) and protective against becoming frail, though not significant ($p=0.07$) over the 10-year time period.

In Table 3, results similarly showed that those with greater contact with Anglo Americans were significantly less likely to become frail (relative risk=0.87; 95% Confidence Interval=0.75–0.99) compared to not frail over the time period.

Discussion

Our overarching goal in this study was to examine the effects of acculturation measures with the likelihood of becoming pre-frail and frail over time in older Mexican Americans. The

hypothesis was that increased acculturation would be protective of transitioning into a pre-frail or frail state over the course of a 10 year study. Our findings are consistent with the hypothesis. Those who had less English proficiency and less contact with Anglo Americans had a significantly greater likelihood of becoming pre-frail or frail over time.

The findings of this research are consistent with research about other cultural groups. For example, Morton and colleagues (1992) found that among older Vietnamese people, less English use and exposure to the English language were associated with a lack of social and economic resources as well as lower scores on the Activities of Daily Living functional scale. Likewise, using data from the Health and Retirement Study, Dunlop and colleagues (2007), reported that being interviewed in Spanish was more highly associated with developing disability as measured by the Activities of Daily Living scale than being interviewed in English. The current research builds upon these findings expanding the breadth of acculturation measures and examining potentially important effects in a quickly growing older ethnic population.

The older Mexican American adults represent a large and growing portion of our society. Recently, Al Snih, and colleagues (2009) reported that among people who did not report any difficulties with activities of daily living at baseline, those who were pre-frail or frail had odds of developing disabilities over the course of 10 years that were as high as 2.4. These findings lead to the increased need for ways to prolong the non-frail state in older Mexican Americans as an additional way to prevent the onset of disability.

The limitations of our research include the self-reported nature of the health conditions. Our respondents reported if a doctor had ever told them that they received a diagnosis of the aforementioned conditions. Unfortunately, these responses were not confirmed with medical record reviews. Furthermore, the sample studied could be considered healthier than those who were left out because of their interview by proxy. Those who were eliminated because of their proxy status were unable to complete the performance measures required to create a frailty score. These participants were more likely to be older with a greater number of comorbid conditions than those who were analyzed. Due to our incorporation of death, however, we were able to retain many other participants who are often lost in longitudinal studies.

The practical implications of these findings are numerous. It has been suggested that a better understanding of the dynamic process of frailty might lead to ideas for interventions and/or treatments to help people to remain in or move to a non frail state (Ottenbacher et al, 2009). The study of acculturation provides a unique avenue for prevention program development. It is possible that less acculturation means that a person is accessing fewer social and economic resources than someone with greater mainstream acculturation. Preventative materials or streamlined healthcare access delivered to persons identified with these characteristics may help to lessen the unintended consequences of a less-acculturated lifestyle.

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Table 1

Baseline characteristics of demographic and health characteristics by frailty status of a sample of older Mexican Americans in the H-EPESE (1995–2005).

	Non Frail	Pre Frail	Frail
	μ(sd)/%	μ(sd)/%	μ(sd)/%
N	918	975	156
Age	72.89 (4.9)	75.1 (6.2)	79.33 (7.3)
Women	58	60	53
Married	56	54	45
Education	4.83 (3.9)	4.89 (3.9)	5.02 (3.9)
Comorbid Conditions	0.8 (0.8)	1 (0.9)	1.2 (0.99)
English Language Proficiency	10.3 (8.8)	8.9 (8.7)	7.2 (7.4)
Contact with Anglos	0.5 (0.9)	0.36 (0.8)	0.27 (0.6)

Table 2

Longitudinal Multinomial Logistic Regression Model of Changes in Frailty Status Among Older Mexican Americans in the H-EPESE (1995–2005):
Language Proficiency

	Prefrail		Frail		Died	
	Risk Ratios (95% CI) P-value					
Time	1.28 (1.23 – 1.34)	<0.0001	1.40 (1.29 – 1.52)	<0.0001	4.62 (4.54 – 4.70)	<0.0001
Age	1.07 (1.05 – 1.09)	<0.0001	1.16 (1.04 – 1.28)	<0.0001	1.21 (1.19 – 1.23)	<0.0001
Female	1.08 (0.91 – 1.26)	0.394	1.04 (0.75 – 1.33)	0.787	0.52 (0.32 – 0.71)	<0.0001
Education	0.90 (0.78 – 1.01)	0.074	0.67 (0.45 – 0.89)	<0.0001	0.78 (0.64 – 0.92)	0.001
Married	0.94 (0.77 – 1.12)	0.499	1.05 (0.76 – 1.35)	0.760	0.77 (0.56 – 0.99)	0.013
Chronic Conditions	1.23 (1.16 – 1.31)	<0.0001	1.58 (1.47 – 1.70)	<0.0001	1.73 (1.65 – 1.81)	<0.0001
Language proficiency	0.90 (0.83 – 0.98)	0.012	0.88 (0.74 – 1.02)	0.069	0.98 (0.88 – 1.08)	0.663

Table 3

Longitudinal Multinomial Logistic Regression Model of Changes in Frailty Status Among Older Mexican Americans in the H-EPESE (1995–2005): Anglo Contact

	Prefrail		Frail		Died	
	Risk Ratio (95% CI) P-value					
Time	1.06 (1.02 – 1.10)	<0.0001	1.19 (1.17 – 1.20)	<0.0001	1.97 (1.92 – 2.03)	<0.0001
Age	1.06 (1.04 – 1.08)	<0.0001	1.12 (1.10 – 1.14)	<0.0001	1.23 (1.21 – 1.25)	<0.0001
Female	1.21 (1.01 – 1.41)	0.035	1.13 (0.95 – 1.30)	0.250	0.65 (0.40 – 0.91)	0.001
Education	0.91 (0.80 – 1.03)	0.099	0.73 (0.63 – 0.82)	<0.0001	0.85 (0.70 – 1.01)	0.058
Married	1.16 (0.97 – 1.36)	0.084	1.16 (0.99 – 1.34)	0.138	1.13 (0.85 – 1.40)	0.364
Chronic Conditions	1.22 (1.14 – 1.30)	<0.0001	1.48 (1.40 – 1.56)	<0.0001	1.84 (1.72 – 1.96)	<0.0001
Anglo contact	0.92 (0.81 – 1.04)	0.146	0.87 (0.75 – 0.99)	0.034	0.96 (0.80 – 1.12)	0.657