Published in final edited form as:

Aging Ment Health. 2010 April ; 14(3): 347–354. doi:10.1080/13607860903292578.

High depressive symptomatology among older community-dwelling Mexican Americans: The impact of immigration

Kerstin Gerst, PhD^{*,1}, Majd Al-Ghatrif, MD^{1,2}, Holly A. Beard, PhD¹, Rafael Samper-Ternent, MD¹, and Kyriakos S. Markides, PhD^{1,2}

¹Sealy Center on Aging, University of Texas Medical Branch, Galveston, Texas

²Preventive Medicine and Community Health, University of Texas Medical Branch, Galveston, Texas

Abstract

Objectives—This analysis explores nativity differences in depressive symptoms among very old (75+) community-dwelling Mexican Americans.

Design—Cross sectional analysis using the fifth wave (2004–2005) of the Hispanic Established Population for the Epidemiological Study of the Elderly (Hispanic EPESE).

Participants—The sample consisted of 1,699 non-institutionalized Mexican American men and women aged 75 and over. Depressive symptoms were measured by the Center for Epidemiological Studies Depression Scale (CES-D). Logistic regression was used to predict high depressive symptoms (CES-D score 16 or higher) and multinomial logistic regression was used to predict sub-threshold, moderate and high depressive symptoms.

Results—Results showed that elders born in Mexico had higher odds of more depressive symptoms compared to otherwise similar Mexican Americans born in the United States. Age of arrival, gender and other covariates did not modify that risk.

Conclusion—The findings suggest that older Mexican American immigrants are at higher risk of depressive symptomatology compared to persons born in the US, which has significant implications for research, policy and clinical practice.

Keywords

Depressive symptomatology; Hispanic Americans; immigrants; Mexican Americans

Introduction

Hispanics aged 65 and over are the fastest growing group of older adults in the US, with a projected increase from just over 2 million elders in 2005 to 15 million by 2050 (U.S. Census, 2008). In part this is due to a high rate of immigration from Mexico (Angel & Whitfield, 2007). During the last several decades the literature on immigration and health consistently suggests that despite high risk factors, foreign-born persons actually appear physically healthier compared to their US-born counterparts (see review by Cunningham, Ruben & Narayan, 2008). However, the evidence regarding such an advantage among older Mexican immigrants in mental health is less compelling.

*Corresponding author, Contact information: Kerstin Gerst, PhD, Sealy Center on Aging, University of Texas Medical Branch, 301 University Blvd., Galveston, Texas 77555, Phone: 409-772-6356, kegerst@utmb.edu

Depression increases morbidity as well as mortality (Evans & Mottram, 2000) and by the year 2020 it is projected to be the second leading cause of disability world wide (World Health Organization, 2009). A growing body of research has examined whether or not an immigrant advantage exists for depressive symptoms as a specific measure of general mental health. However, the evidence is equivocal and few studies examined very old Mexican Americans. Below we examine the impact of immigrant status on psychological distress among Mexican Americans aged 75 and over living in the Southwestern United States.

Literature Review

Despite an increase in research on late life depression (Blazer, 2003), extant studies examining the link between mental health and immigration among immigrants from Mexico as compared to their US-born Mexican counterparts are few and their findings are not conclusive. Several older studies support the idea of an immigrant advantage with reports of lower risk of depression among Hispanic immigrants (e.g. Moscicki, 1989; Burnam, Hough, Karno, Escobar & Telles, 1987; Vega, Warheit & Palacio, 1985). More recent studies support such a conclusion as well. A study by Vega and colleagues (1998) found that US-born Mexican Americans had higher rates of mood, anxiety and substance use disorders compared to their foreign-born counterparts. Similar findings were reported by Ortega, Rosenheck, Alegría & Desai (2000) and Grant et al (2004), where US-born Mexican Americans had higher rates of psychiatric disorders than foreign-born respondents. More recently, Alegría et al (2008) found evidence of an immigrant advantage, with immigrants from Mexico being at lower risk compared to US-born Mexican Americans in depressive and anxiety disorders. Though each of these studies found evidence in support of an immigrant advantage, all studies included persons aged 18 and over and so did not explicitly separate out their analyses by age.

Other studies have found that the prevalence and risk factors for depression were actually higher for older immigrants compared to older US-born Mexican Americans. The first to report such a finding were Gonzalez, Haan & Hinton, (2001). Using data from the 1998/1999 Sacramento Area Latino Study on Aging (SALSA) on subjects aged 60 and older, the authors found that both the prevalence as well as the risk factors for depression were higher for older immigrants than for US-born Mexican Americans. They also found that higher levels of acculturation were associated with lower depressive symptomatology.

Previous reports using the baseline wave of the Hispanic EPESE (1993-1994) found higher odds of depressive symptomatology for older Mexican immigrants compared to their US-born counterparts. Ostir, Eschbach, Markides & Goodwin (2003) found that controlling for individual and neighborhood factors, being born in the US was associated with lower CES-D score than being born in Mexico. Black, Markides & Miller (1998) found that recent immigrants (less than five years in the US) regardless of gender were at higher risk for high depressive symptoms as were non-recent immigrant women. In contrast, older non-recent immigrant men had a lower risk of having depressive symptoms compared to their US-born counterparts. In a study examining subjects aged 45 and older from lower Rio Grande Valley of Texas (Cuellar, Bastida & Braccio, 2004) it was found that neither immigration status nor length of residence in the US were significant predictors of depressive symptomatology.

This analysis aims to explore the association between immigrant status and depressive symptoms among very old Mexican Americans and to identify the factors that might modify this association. The Hispanic EPESE in its fifth wave during 2004-2005 added a new sample of Mexican Americans aged 75 and older, giving us the opportunity to revisit this topic using a large and representative sample of very old Mexican Americans residing in the Southwestern United States.

Conceptual Model and hypotheses

Although the evidence on immigration and mental health has been far from conclusive, a social stress model has been applied to predict greater psychological distress among ethnic minorities (e.g. Aranda & Miranda, 1997; Min, Moon & Lubben, 2005). Such a model would predict that foreign born older Mexican Americans are at particular risk for psychological distress due to migration stressors as well as stressors associated with acculturation and holding a minority status in the United States (Aranda, & Miranda, 1997; Markides & Mindel, 1987). Though being a member of a minority group and the potential marginalization of society is stressful regardless of nativity, it is possible that this stress is compounded by immigration status. It can also be hypothesized that those who arrived in the US at later ages (likely to be less acculturated) would have higher odds of reporting high depressive symptomatology. However, it is not anticipated that acculturation erases the impact of immigration entirely since the stress related to immigration may be both persistent and cumulative over the life course (Aranda & Miranda, 1997).

Methods

Data and Sample

We employ data from the fifth wave (2004/2005) of the Hispanic Established Population for Epidemiologic Studies of the Elderly (Hispanic EPESE). The Hispanic EPESE is the most recent of the five EPESE panel surveys conducted around the country and is the largest epidemiologic study of the health and health care needs of Mexican American elders. Area probability sampling was used to obtain the baseline sample of 3,050 Mexican Americans aged 65 and over from the Southwestern United States (Texas, New Mexico, California, Arizona and Colorado) (Markides, Stroup-Benham, Black, Satish, Perkowski, & Ostir, 1999). Subjects were followed up every two or three years. At Wave 5 (2004-2005) an additional sample of 902 older Mexican Americans were selected from the sample region using similar procedures. The fifth wave included a total of 2,069 Mexican Americans aged 75 and over. Of these 107 respondents (6% of the total sample) were excluded from the analyses because of missing values on the CES-D and an additional 263 were excluded because of missing data on other variables in the analysis. The mean age of these subjects was higher, they had slightly higher education, higher rates of ADL limitation, and were more likely to be proxy interviews compared to cases included in the study. The removed cases did not differ significantly by nativity status. The unweighted analytic sample consisted of 1,699 respondents. However, all analyses were conducted using a weighted sample (N=1,619).

Measures

Dependent variable—This analysis uses the Center for Epidemiological Studies Depression Scale (CES-D) to capture depressive symptomatology. The 20-item scale consists of 16 negative affect measures (e.g. “I felt fearful”) and four positive affect indicators (e.g. “I enjoyed life”). For each measure, respondents report how often they had this feeling in the past week, ranging from 0 “rarely or none of the time (less than 1 day)” to 3 “most or all of the time (5-7 days)”. The scores are summed (with positive statements reverse scored) creating a symptom range from 0-60.

For the logistic regression analyses, subjects who scored 16 or above on the CES-D were considered to have high depressive symptomatology, which might be considered related to clinically relevant depression (Radloff, 1977; Radloff & Locke, 1986). Although a majority of research using the CES-D has used this cut-off point of 16, some studies have suggested different cut-off points depending on the sample and the purpose. For instance, some researchers are interested in sub-threshold depression, where respondents still score relatively

high on the CES-D (between 11-15) but would not meet a clinically significant depression level (Blazer, 2003). Additionally, some authors have suggested that due to higher rates of illness for older adults, a way to increase specificity for this population is to use a higher cut-off score such as 21 (Himmelfarb & Murrell, 1983; Lyness, Noel, Cox, King, Conwell & Caine, 1997). Therefore, we analyze a four-category CES-D ranging from low (less than 11), sub-threshold (11-15), moderate (16-20) and high (21 plus) depressive symptomatology.

Independent variables—The main independent variable of interest is whether a respondent is an immigrant. Immigrant status was determined by asking the respondent if he/she was born in another country. In all regression analyses US-born Mexican Americans serve as the reference group. The analysis further breaks down immigrants by their age of arrival into persons that are considered 1.5 generation (i.e. arrived in the US at age 14 or younger) or persons that arrived in US as adults (1st generation) (Rumbaut, Massey & Bean, 2006). Additionally, the analyses controlled for language of interview (English vs. Spanish).

The models included controls for respondents' health and cognitive status. A comorbidity index tallied whether subjects had ever been told by a doctor that they had diabetes, cancer, heart attack or stroke. Functional disability was measured as a dichotomy for whether the respondent needed help with or could not perform one or more Activities of Daily Living (ADLs): eating, bathing, personal grooming, dressing, getting from a bed to a chair, walking across a room and using a toilet. Cognition was controlled for in the models using the continuous variable for the Mini Mental Status Exam (MMSE) score. The MMSE is considered a reliable, valid measure of cognitive impairment for Mexican American samples (Espino, Lichtenstein, Palmer & Hazuda, 2001) although research using the Hispanic EPESE suggests that the MMSE score reflects test bias (Black, et al, 1999).

Financial stressors, neighbourhood satisfaction and social support were also controlled for in each regression model. Subjects were coded as experiencing financial strain if they stated they had either difficulty meeting monthly payments on their bills or that they did not have enough money to make ends meet at the end of the month. Social support was measured by whether or not respondents had a confidante and by their living arrangement. Respondents were coded as having a confidante if they stated that they had a family member or friend with whom they could discuss their deepest problems. Marital status was measured by whether or not they were married at the time of the interview. Living arrangements were dichotomized into living alone/ living with at least one other person (reference category). Respondents who reported being very satisfied or satisfied with their neighbourhood were coded as satisfied with their neighborhood while the remaining cases are coded as not satisfied or neutral (reference category).

Because anti-depression as well as anti-anxiety medications may influence responses to a symptom scale such as the CES-D, all models controlled for whether a respondent reported using either anti-depression medication(s) and/or anti-anxiety drugs in the last two weeks. This was determined by interviewers asking respondents to show all medications used in the past two weeks. Each medication was coded into a medication category according to their indication (e.g. anxiety or depression), regardless of drug brand.

Finally, regression analyses controlled for various sociodemographic variables. Demographic variables included the age of the respondent (continuous), their gender and educational attainment (more than sixth grade).

Analytic approach

Sample descriptive data are stratified by nativity and analyzed by using t-tests and chi-square. Bivariate analyses were done to compare prevalence of high depressive symptoms for each of

the respondents' characteristics. Prevalence rates are reported using the standard cut-off point of 16 to report high/low depressive symptoms. Additionally, two sets of analyses were employed to investigate the number of depressive symptoms as the outcome. First, logistic regression analyses were run to explore the binary outcome of high depressive symptoms using the cut off score of 16. Second, multinomial logistic regression models were run to examine the effect of immigrant status on a categorical measure of depressive symptoms, comparing persons that had very low depressive symptoms (score less than 11) to those who had sub-threshold (score 11-15), moderate (score 16-20) and high (score 21 and above) depressive symptoms. This categorical measure was used to explore different cut-off points in the CES-D and was compared across nativity status. Models using the categorical variable as an outcome were analyzed using SAS *Proc Surveylogistic*, where persons reporting very low depressive symptoms served as the reference category. All data analysis was conducted using SAS® 9.2 (SAS Institute, Cary, N.C.) to adjust for complex sample design.

Results

Study Population

Table 1 presents the sample characteristics separated out by immigrant status. Of particular note is that the mean CES-D score was significantly higher among immigrants (10.1) than among US-born Mexican Americans (8.7). Among immigrants, the average years lived in the United States was 46 (SD 19.5) suggesting that relatively few immigrants in this sample had arrived recently. Additionally, comparisons between the two samples show that immigrants were slightly older and had a higher percentage who reported financial strain compared to those born in the US. Immigrants had an average of four years of education whereas the US-born had an average of seven years of education. Over one-third (35%) of the US-born were interviewed in English, whereas only 5% of the immigrants were. The average MMSE score was higher for US-born respondents compared to immigrants. US-born respondents also had a slightly higher average number of chronic conditions compared to immigrant elders. The two samples did not differ significantly on the remaining variables of interest.

Bivariate Analyses

Bivariate results displayed in Table 2 show the prevalence rates of high depressive symptoms by groups. The results indicate that prevalence rates of high depressive symptoms were higher for immigrants, with 23% of immigrants scoring high (≥ 16) on the CES-D, compared to 17% of US-born elders. Additionally, females had higher rates of high depressive symptomatology, as did persons without a confidante, respondents with chronic conditions, those with ADL impairments, people living alone, unmarried elders, those experiencing financial strain, and those reporting taking anti-depressants or anti-anxiety medications. Whether immigrants arrived at ages younger than 14 (1.5 generation) or at age 14 or older was not significant at the bivariate level and was therefore not included in subsequent analyses.

Logistic Regression Analyses

In order to examine the immigrant difference in depth, several analyses were performed. The binomial logistic model (Table 3) shows that immigrants have significantly higher odds (OR=1.73) of scoring at 16 or above on the CES-D than otherwise similar US-born Mexican American elders. Several other factors in the model were significant predictors of high levels of depressive symptoms. Respondents living alone had higher odds of reporting high depressive symptomatology compared to persons living with at least one other person (OR=1.78). Persons reporting financial strain had significantly higher odds of scoring 16 or above. The two physical health indicators (count of chronic conditions and having one or more ADL limitations) were significant and positive correlates of high depressive symptoms.

Finally, both anti-depressant medications and anti-anxiety medications were positively and significantly related to high depressive symptoms.

Additional models were run (results not shown) to determine if there was an interaction effect by gender for any of the significant variables. No interactions proved significant. Models including an interaction for gender and immigration were not significant, which suggests that for this sample of immigrants, gender did not moderate the effect of immigration on high depressive symptoms.

Multinomial Logistic Regression

We also examined a four-category variable of depressive symptoms consisting of very low depressive symptoms (score < 11), sub-threshold (11-15), moderate (16-20) and high depressive symptoms (≥ 21). Multinomial logistic regression results comparing the three high categories to very low or no depressive symptoms indicated that immigrants had significantly higher odds of being in one of the two highest CES-D score categories compared to their US-born counterparts. The largest odds ratio was for the 16-20 score category, where immigrants had 2.19 higher odds of scoring in this group of scores (versus less than 11) compared to US-born Mexican Americans. Though the effect was smaller, and less strong, immigrants also had higher odds (OR=1.59) of scoring 21 or over (versus less than 11) compared to their US-born counterparts. There was no significant difference in nativity for the sub-threshold depression measure (score between 11 and 15). Therefore, results suggest that even when controlling for a variety of risk factors, older immigrants have higher odds of having high depressive symptom scores compared to older US-born Mexican Americans, though this effect was not found for sub-threshold depression.

Discussion

The purpose of this study was to examine the impact of immigrant status on depressive symptomatology among an older sample of Mexican Americans living in the Southwest. The average depressive symptomatology score was higher among the immigrant group of elders compared to persons born in the US. In addition, immigrants were more likely to report high depressive symptoms (CES-D score 16 and over) than the US-born Mexican Americans.

Even after controlling for a range of covariates, our multivariate analyses suggest that older Mexican American immigrants are at a significantly higher risk of high depressive symptoms than their US-born counterparts. Though this finding is different from several recent studies, the outcomes corroborate the conclusions of other researchers such as Gonzalez, Haan, & Hinton (2001) as well as Black, Markides & Miller (1998) who found that older Mexican American immigrants had higher risk for depressive symptoms. However, using baseline Hispanic EPESE data, Black, Markides and Miller (1998) found that there were gender interactions with immigration, which the current study did not find. It is possible that the gender difference does not hold for the older population (75+) compared to the relatively younger sample (65+) of prior studies.

We also explored whether additional covariates such as acculturation measures mediated the effect of immigrant status. This study did not find that age of immigration mediated the impact of immigration on depressive symptoms. On the other hand, whether the survey was taken in English or in Spanish, another rough proxy for acculturation, was significant. Persons that took the survey in English had higher odds of having high depressive symptoms. While these findings may be due to the relatively high collinearity between nativity and language of survey, they may also suggest a protective effect for those who took the survey in Spanish. It is possible that taking the survey in Spanish serves as an indirect measurement for additional cultural and/or social factors not accounted for in this study. Unmeasured factors could include larger

kinship networks and higher familism (i.e. centrality of family), both of which suggest strong familial support for the elderly (Aranda & Miranda, 1997). Such factors could mediate the effect of life stressors put forth by the social stress hypothesis and therefore buffer their effect on mental health.

However, survey language did not fully mediate the effect of immigrant status on the outcome. This conclusion differed from results reported by Gonzalez, Haan & Linton, (2001). This could be due to the lack of precise acculturation measures used in the current study. Gonzalez, Haan & Linton (2001) measured acculturation with the 19-item Geriatric Acculturation Rating Scale, whereas the current study only controlled for it using the language of interview and age of arrival to the US. Additionally, the findings about acculturation and mental health in the overall literature are not clear, (Rogler, Cortes, Malgady, 1991) which suggests that future studies should examine this in more detail.

Our findings generally echoed those of previous research. Living alone was associated with high depressive symptoms (e.g. Blazer, 2003). Some studies have found that social support is associated with lower odds of having high depressive symptoms for men but not for women (Blazer, 2003; Black, Markides & Miller, 1998). This study did not find a significant association between social support and high depressive symptoms, nor did it find any interactions by gender.

Previous studies have found that neighborhood characteristics influence odds of high depressive symptoms in Mexican American elders (Ostir, Eschbach, Markides & Goodwin, 2003). We did not find a significant neighbourhood effect, although the direction of the coefficient was in the expected direction. Finally, having medical comorbidities, cognitive comorbidities and having one or more ADL limitations was also significantly associated with having high depressive symptoms, which is consistent with the literature (Blazer, 2003).

The findings from this study are not consistent with an immigrant advantage model, but rather seem to support the social stress model. It is possible that though immigrants may be initially selected on better physical and mental health, they develop more physical and mental problems in later life. This could be due to the stress related to migration and potentially due to the marginalization by society. Although a majority of the sample was not composed of recent migrants, immigrants still showed higher odds of high depressive symptoms compared to persons that were born in the US. This finding seems to support evidence found in previous literature that post immigration adjustment can be persistent and even cumulative (see Aranda & Miranda, 1997). For Mexican immigrants in particular, the stressor of immigration may be compounded by the fact that in the US they are part of an ethnic minority group and therefore may have compounded stress due to minority group status.

Additional cumulative disadvantage can build for Mexican immigrants due to life-long labour disadvantages. Many elderly immigrants have spent a lifetime working under harsh working conditions, which can lead to health problems in later life (Angel, 2003). Such physically demanding work is often accompanied by low pay, which in turn decreases the ability to address health problems because of financial constraints (Angel, 2003). Even once they reach age 65 and many become eligible for Medicare, foreign born Mexican American elders still have a disadvantage in health care coverage (Angel & Whitfield, 2007). Using 1990 US Census Bureau data, Angel (2003) found that 12.4% of Mexican immigrants over age 65 are uninsured compared to only 2.4% of Mexican Americans. Therefore, although immigrants are often selected to be among the healthiest (i.e. healthy migrant effect), the lifetime cumulative disadvantage due to a combination of social stress, physical hardship, financial insecurity and lack of access to healthcare may be an explanation for the higher risk of depressive symptoms among immigrants.

Lack of access to healthcare may also lead to disparities in the use of formal mental health services among immigrants and native-born persons, which may further explain our findings. Research has found that Mexican American immigrants are less likely to utilize mental health services compared to persons born in the US (Vega, Kolody, Aguilar-Gaxiola, & Catalano, 1999). Although the results in this study did not show any significant differences in high depressive symptoms by nativity status among persons that reported taking anti-depressant medications, this finding may have had limitations. Although the study controlled for which medications the respondent had taken in the two weeks prior to the survey, it was not possible to determine the length of time the respondent had been taking the medications, the dosage of the medication, nor adherence to the medication regimen. Problems with regimen adherence could be due to difficulties understanding the prescription, problems obtaining refills (because of limited access to health care or lack of economic resources) and/or stigma associated with taking psychiatric medications. Such factors may influence whether medical treatment is effective. Additionally, this study does not have any information on possible psychotherapies, which are often used either in conjunction with, or in place of medications, to treat depression. Since US-born Hispanics are significantly more likely to use mental health as well as general medical care services, they may be more likely to be diagnosed and consequently appropriately treated for depression. It is therefore possible that higher odds of appropriate treatment could explain lower scores on the CES-D for US-born Hispanics.

Limitations

This study had several limitations that are worth noting. First, the analysis employed cross-sectional data which makes it impossible to determine any causal relationships. Additionally, persons who did not complete any of the 20 items on the CES-D scale were excluded from the sample. Though it is not clear what effect such exclusion might have, it is worth noting that the excluded sample was somewhat different in terms of demographic characteristics from the final sample used in this study. Finally, the CES-D measure is not a diagnostic tool and therefore does not provide a medical diagnosis of depression. Rather, the score captures a range of depressive symptoms, where higher scores suggest psychological distress. However, this instrument has been shown to have high internal consistency across age and racial/ethnic subgroups (Radloff, 1977 & Roberts, 1980), high reliability coefficients (.82-.91) (Himmelfarb & Murrell, 1983), and factor structures that have been consistent even in the very old (Radloff & Teri, 1986). Despite these limitations, the findings contribute to the ongoing debate about a potential immigrant advantage by examining the relatively under-researched area of older Mexican American immigrants and their depressive symptoms compared to their US-born counterparts.

Implications

These findings have policy, research as well as clinical implications. Because the immigrant advantage generally suggests that foreign nativity protects against negative health outcomes, this study suggests that some subgroups (e.g. older Mexican Americans) may actually have *higher* rates of depressive symptoms compared to US-born persons. This underscores the importance of cross-cultural research when exploring mental health issues. Additionally, understanding the increased risk of high depressive symptoms among older immigrants can inform clinical practice and can guide public health policy.

Although the CES-D is not a diagnostic tool for depression, studies have shown that it can predict current and future depression (Roberts & Vernon, 1983) and can serve as a useful screening instrument for major depression (Lyness, et. al, 1997). Overall, depression is associated with many negative outcomes, including increased disability, higher chance of suicide, as well as increased use of hospital and outpatient medical services (Blazer, 2003). Being aware of such increased risks can lead to earlier diagnoses, which may perhaps lead to

earlier/more effective treatment and can improve quality of life and reduce mortality and disability rates (Evans & Mottram, 2000). This is particularly important for older adults, since the diagnosis of depression in older adults is often difficult (van't Veer-Tazelaar et al, 2008). Understanding the unique risks of immigration can inform public health initiatives as well, where mental health care services could be targeted towards this specific population in order to provide outreach to a vulnerable group of elders.

Acknowledgments

This research was supported by a grant from the National Institute on Aging (5 T32 AG000270-10)

Reference List

- Alegria M, Canino G, Shrout PE, Woo M, Duan N, Vila D, Torres M, Chen C, Meng X. Prevalence of mental illness in immigrant and non-immigrant US Latino Groups. *American Journal of Psychiatry* 2008;165(3):359–368. [PubMed: 18245178]
- Angel JL. Devolution and the social welfare of elderly immigrants: Who will bear the burden? *Public Administration Review* 2003;63(1):79–89.
- Angel, JL.; Whitfield, KE. Setting the stage: Hispanic health in the Americas. In: Angel, JL.; Whitfield, KE., editors. *The health of aging Hispanics: The Mexican-origin population*. Springer Science +Business Media, LLC; New York: 2007. p. 1-14.
- Aranda, MP.; Miranda, MR. Hispanic aging, social support and mental health: Does acculturation make a difference?. In: Markides, KS.; Miranda, MR., editors. *Minorities, aging, and health*. Sage Publications; Thousand Oaks, CA: 1997. p. 271-294.
- Black SA, Espino DV, Mahurin R, Lichtenstein MJ, Hazuda HP, Farbrizio D, Ray L, Markides KS. The influence of noncognitive factors on the Mini-Mental State Examination in older Mexican-Americans: Findings from the Hispanic EPESE. *Journal of Clinical Epidemiology* 1999;52(11):1095–1102. [PubMed: 10527004]
- Black SA, Markides KS, Miller TQ. Correlates of depressive symptomatology among older community-dwelling Mexican Americans: The Hispanic EPESE. *Journal of Gerontology: Social Sciences* 1998;4:S198–S208.
- Blazer DG. Depression in late life: Review and commentary. *Journals of Gerontology: Medical Sciences* 2003;58A:249–265.
- Burnham MA, Hough RL, Karno M, Escobar JJ, Telles CA. Acculturation and lifetime prevalence of psychiatric disorders among Mexican Americans in Los Angeles. *Journal of Health and Social Behavior* 1987;28:89–102. [PubMed: 3571910]
- Cuellar I, Bastida E, Braccio SM. Residency in the United States, subjective well-being, and depression in an older Mexican-origin sample. *Journal of Aging and Health* 2004;16(4):447–466. [PubMed: 15271265]
- Cuningham C, Ruben JD, Narayan KM. Health of foreign-born people in the United States: a review. *Health Place* 2008;14(4):623–635. [PubMed: 18242116]
- Espino DV, Lichtenstein MJ, Palmer RF, Hazuda HP. Ethnic differences in Mini-Mental State Examination (MMSE). *Journal of the American Geriatrics Society* 2001;49(5):538–48. [PubMed: 11380745]
- Evans M, Mottram P. Diagnosis of depression in elderly patients. *Advances in Psychiatric Treatment* 2000;6:49–56.
- Gonzalez HM, Haan MN, Hinton L. Acculturation and the prevalence of depression in older Mexican Americans: Baseline results of the Sacramento Area Latino Study on Aging. *Journal of the American Geriatrics Society* 2001;49:948–953. [PubMed: 11527487]
- Grant BF, Stinson FS, Hasin DS, Dawson DA, Chou SP, Anderson K. Immigration and lifetime prevalence of DSM-IV psychiatric disorders among Mexican Americans and Non-Hispanic Whites in the United States. *Archives of General Psychiatry* 2004;6:1226–1233. [PubMed: 15583114]
- Himmelfarb S, Murrell SA. Reliability and validity of five mental health scales in older persons. *Journal of Gerontology* 1983;38:333–339. [PubMed: 6841929]

- Lyness JM, Noel TK, Cox C, King DA, Conwell Y, Caine ED. Screening for depression in elderly primary care patients. *Archives of Internal Medicine* 1997;157:449–454. [PubMed: 9046897]
- Markides, KS.; Stroup-Benham, CA.; Black, SA.; Satish, S.; Perkowski, LC.; Ostir, GV. The health of Mexican American Elderly: selected findings from the Hispanic EPESE. In: Wykle, ML.; Ford, AB., editors. *Serving Minority Elders in the Twenty-first Century*. Springer Publishing; New York, NY: 1999. p. 72-90.
- Markides, KS.; Mindel, CH. *Aging and ethnicity*. Sage; Newbury Park, CA: 1987.
- Min JW, Moon A, Lubben JE. Determinants of psychological distress over time among older Korean immigrants and Non-Hispanic White elders: Evidence from a two-wave panel study. *Aging & Mental Health* 2005;9(3):210–222. [PubMed: 16019275]
- Moscicki ER, Locke BZ, Rae DS, Boyd JH. Depressive symptoms among Mexican Americans: The Hispanic Health and Nutrition Examination Survey. *American journal of Epidemiology* 1989;130:348–360. [PubMed: 2750730]
- Ortega AN, Rosenheck R, Alegría M, Desai RA. Acculturation and the lifetime risk of psychiatric and substance use disorders among Hispanics. *Journal of Nervous and Mental Disease* 2000;188:728–735. [PubMed: 11093374]
- Ostir GV, Eschbach K, Markides KS, Goodwin JS. Neighbourhood composition and depressive symptoms among older Mexican Americans. *Journal of Epidemiology and Community Health* 2003;57:987–992. [PubMed: 14652267]
- Radloff LS. The CES-D scale: a self report depression scale for research in the general population. *Applied Psychological Measurement* 1977;1(3):385–401.
- Radloff, LS.; Locke, BZ. The community mental health survey and CES-D scale. In: Weisman, MM.; Myers, JD.; Ross, CE., editors. *Community survey of psychiatric disorders*. Rutgers University Press; New Brunswick, NJ: 1986.
- Radloff LS, Teri L. Use of the Center for Epidemiological Studies-Depression Scale with older adults. *Clinical Gerontologist* 1986;5:119–136.
- Roberts RE. Reliability of the CES-D in different ethnic contexts. *Psychiatry Research* 1980;2:125–134. [PubMed: 6932058]
- Roberts RE, Vernon SW. The Center for Epidemiologic Studies Depression Scale: its use in a community sample. *American Journal of Psychiatry* 1983;140:41–46. [PubMed: 6847983]
- Rogler LH, Cortes DE, Malgady RG. Acculturation and mental health status among Hispanics. *American Psychologist* 1991;46(6):585–597. [PubMed: 1952420]
- Rumbaut RG, Massey DS, Bean FD. Linguistic life expectancies: Immigrant language retention in southern California. *Population and Development Review* 2006;32(3):447–460.
- U.S. Census Bureau. Older Americans 2008: Key indicators of well-being. Federal Interagency Forum on Aging-Related Statistics; Washington, D.C.: 2008. Retrieved online January 2008 from: <http://agingstats.gov>
- Van't Veer-Tazelaar PJ, van Marwijk HWJ, Jansen APD, Rijmen F, Kostense PJ, van Oppen PC, van Hout HPJ, Stalman WAB, Beekman ATF. Depression in old age (75+), the PIKO study. *Journal of Affective Disorders* 2008;106:295–9. [PubMed: 17720253]
- Vega WA, Kolody B, Aguilar-Gaxiola S, Alderete E, Catalano R, Caraveo-Anduaga J. Lifetime prevalence of DSM-III-R psychiatric disorders among urban and rural Mexican Americans in California. *Archives of General Psychiatry* 1998;55:771–778. [PubMed: 9736002]
- Vega WA, Kolody B, Aguilar-Gaxiola S, Catalano R. Gaps in service utilization by Mexican Americans with mental health problems. *American Journal of Psychiatry* 1999;156(6):928–934. [PubMed: 10360134]
- Vega WA, Warheit G, Palacio R. Psychiatric symptomatology among Mexican American farm workers. *Social Science and Medicine* 1985;20(1):39–45. [PubMed: 3871969]
- World Health Organization. Depression. 2009. Retrieved online January, 2009 from: www.who.int/mental_health/management/depression/definition/en/index.html

Table 1

Sample Descriptives

	US-born	Immigrant
CES-D score Mean (SD)	8.7 (8.4)	10.1 (9.4) **
Range	0-46	0-51
Age Mean (SD)	81 (4.4)	82 (5.3) **
Years of education Mean (SD)	6 (4.2)	4 (3.3) ***
Years in the US Mean (SD)		46 (19.5)
MMSE Score	23 (5.5)	21 (6.3) ***
Number of chronic conditions Mean (SD)	0.7 (0.8)	0.7 (0.8)
Percent that live alone	28%	25%
Percent experiencing financial strain	25%	27% *
Percent female	61%	59%
Percent married	44%	44%
Percent who took the survey in English	35%	5% ***
Percent who has at least one ADL limitation	31%	31%
Percent who has confidante	96%	95%
Percent satisfied with neighborhood	97%	99%
Percent taking anti-depression medication	5%	6%
Percent taking anti-anxiety medication	4%	4%
Total N (unweighted)	982	717

Note: Data weighted (N=1,699)

p≤.001

**
p≤.01

*
p≤.05

Table 2Prevalence of high depressive symptoms (CES-D score ≥ 16), bi-variate statistics

	N (% of Total) ^a		Prevalence of high depressive symptoms
US-born	982	(58%)	17% **
Immigrant	679	(42%)	23%
1.5 Generation	86	(13%)	28%
First Generation	593	(87%)	23%
Financial Strain	416	(26%)	28% **
Not Financial Strain	1203	(74%)	17%
Female	979	(60%)	23% **
Male	640	(40%)	15%
Married	716	(44%)	16% **
Not Married	903	(56%)	23%
Survey in Spanish	1251	(77%)	19%
Survey in English	368	(23%)	22%
Years of Education			
0-6	1073	(66%)	21% **
7-11	345	(21%)	18%
12+	200	(12%)	15%
HH size			
1	436	(27%)	27% ***
2	669	(41%)	14%
3+	514	(32%)	20%
Chronic Conditions			
0	788	(49%)	15% ***
1	582	(36%)	22%
2 or more	248	(15%)	28%
No ADL impairment	499	(69%)	14% ***
One or more ADL impairments	112	(31%)	31%
Does not have a confidante	142	(9%)	29% *
Has a confidante	1477	(91%)	19%
Satisfied with neighborhood	1578	(97%)	19% *
Not satisfied	41	(3%)	40%
Taking anti-depressants	90	(6%)	37% **
Not taking anti-depressants	1529	(94%)	19%
Taking anti-anxiety drugs	66	(4%)	32% *
Not taking anti-anxiety drugs	1552	(96%)	19%

Note: Data weighted (

p $\leq$.001 - Significance tests compare prevalence of high depressive symptoms within groups**
p $\leq$.01 - Significance tests compare prevalence of high depressive symptoms within groups

* $p \leq .05$ - Significance tests compare prevalence of high depressive symptoms within groups

^aTotals may not add up to 100% due to rounding

Table 3

Logistic Regression Analyses predicting a score of 16 or higher on the CES-D

	O.R.	95% C.I.	p-value
Immigrant	1.73	(1.14, 2.62)	0.009
Survey in English	1.67	(1.03, 2.71)	0.038
Financial Strain	1.54	(1.09, 2.17)	0.014
Married	1.11	(0.71, 1.76)	0.642
Lives alone	1.78	(1.20, 2.65)	0.004
Does not have a confidante	1.55	(0.98, 2.46)	0.060
Satisfied with neighborhood	0.39	(0.15, 1.00)	0.051
Female	1.53	(1.00, 2.35)	0.050
More than sixth grade	1.07	(0.69, 1.64)	0.777
Age	0.98	(0.94, 1.02)	0.252
Total MMSE Score	0.94	(0.91, 0.96)	.0001
1 or more ADLs	1.85	(1.20, 2.85)	0.006
Chronic conditions	1.29	(1.06, 1.58)	0.013
Depression Medication	1.97	(1.03, 3.77)	0.040
Anti-anxiety medication	2.35	(1.07, 5.14)	0.032

Notes: Data weighted (N=1,619), OR=Odds Ratio CI=Confidence Interval

Table 4
Multinomial Logistic Regression Results for three category depressive symptoms, by nativity status

	CES-D Score					
	11-15	16-20	21+			
	<u>O.R.</u>	<u>95% C.I.</u>	<u>p-value</u>	<u>O.R.</u>	<u>95% C.I.</u>	<u>p-value</u>
Immigrant (vs. US-born)	1.04	(0.67, 1.62)	0.848	2.19	(1.33, 3.61)	.002
				1.59	(1.01, 2.50)	.045

Comparison group= CES-D score 0-10Notes: Data weighted (N=1,619), OR=Odds Ratio CI=Confidence Interval
In addition to nativity status, the model controlled for: language of interview, gender, education, age, marital status, financial strain, ADL limitations, chronic conditions, MMSE score, living alone, having a confidante, neighborhood satisfaction and medications. Results for full models available upon request.