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Emotional and cognitive health correlates of leisure activities in older Latino and Caucasian women

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Abstract

This study examined differences in the frequency of leisure activity participation and relationships to depressive symptom burden and cognition in Latino and Caucasian women. Cross-sectional data were obtained from a demographically matched subsample of Latino and Caucasian (n = 113 each) post-menopausal women (age ≥60), interviewed in 2004–06 for a multi-ethnic cohort study of successful aging in San Diego County. Frequencies of engagement in 16 leisure activities and associations between objective cognitive performance and depressive symptom burden by ethnicity were identified using bivariate and linear regression, adjusted for physical functioning and demographic covariates. Compared to Caucasian women, Latinas were significantly more likely to be caregivers and used computers less often. Engaging in organized social activity was associated with fewer depressive symptoms in both groups. Listening to the radio was positively correlated with lower depressive symptom burden for Latinas, and better cognitive functioning in Caucasians. Cognitive functioning was better in Latinas who read and did puzzles. Housework was negatively associated with Latinas' emotional health and Caucasians' cognitive functioning. Latino and Caucasian women participate in different patterns of leisure activities. Additionally, ethnicity significantly affects the relationship between leisure activities and both emotional and cognitive health.

Introduction

Depressive- and dementia-related disorders pose a growing challenge to older adults and the U.S. public health system (Chapman, Williams, Strine, Anda & Moore, 2006; Jeste et al, 1999). Latino older adults, who comprise the fastest growing sub-population of American older adults (Angel & Whitfield, 2007; U.S.Census Bureau, 2003) are particularly vulnerable to these conditions. Compared to Caucasians, they suffer from significantly higher rates of depressive disorders (24–39%) (Pratt & Brody, 2008; Raji, Reyes-Ortiz, Kuo, Markides, & Ottenbacher, 2007) and can expect a six-fold increase in the incidence of Alzheimer's disease and dementia by the year 2050 (Gallagher-Thompson, Solano, Coon, & Areal, 2003). Furthermore, they are highly susceptible to chronic diseases such as diabetes mellitus (Haan et al, 2003; Hertz, Unger, & Ferrario, 2006) and cardiovascular disease (AHA, 2008), which are associated with an increased risk for dementia and depression

(Anderson, Freedland, Clouse & Lustman, 2001; Craft, 2009; Zimmerman, Mast, Miles, & Markides, 2009).

Growing evidence suggests that leisure activities confer distinct benefits to emotional and cognitive health, which may operate by modifying any one or a combination of variables, such as social isolation, mental stimulation, or physical health risk factors. For example, handcrafts, computing, art, music, and social and productive leisure activities have been linked to lower levels of depression (Chan, Chan, Mok, Tse, & Yuk, 2009; Garcia-Martin, Gomez-Jacinto, & Martimortugues-Goyenechea, 2004; Menec, 2003). Volunteer work, in particular, has been documented to lower depressive symptom burden (Musick & Wilson, 2003; Thoits & Hewitt, 2001). In cognitive-behavioral therapy, leisure activities are integral to promoting “pleasant events” in treating depression (Cernin & Lichtenberg, 2009). Longitudinal studies also demonstrate that engaging in cognitively demanding activities (playing board games and reading) and social leisure activities improve cognition and/or reduce the risk for Alzheimer’s disease (Wang et al, 2006; Wilson et al, 2002). In addition, leisure activities may function by reducing intermediary risk factors for cognitive decline and depression, such as blood pressure, serum cortisol, waist circumference, and body mass index (Pressman et al., 2009).

In the general population, the relationship between physical exercise and mental health is well established (Strohle, 2009), but in older adults the association is not as strong (Blake, 2009). Age-related changes in exercise physiology and co-occurring geriatric medical syndromes pose additional challenges to lifestyle interventions, such as increasing physical activity, and, as a result, recommendations for tailoring physical activity interventions to older adults have been developed (Cress et al., 2005). Participation in non-physical leisure and social activities by older adults has been less well studied and may offer an alternative means for improving ‘brain health’ and build on existing psychosocial or lifestyle interventions. Specifically, leisure activity patterns, preferences, and purported benefits have not been investigated in older Latinos, despite Latinos’ disproportionate burden of disease and projected population growth.

In addition to addressing the physical limitations of older adults, research is also needed to develop culturally tailored lifestyle and psychosocial interventions to improve their effectiveness, as they are presently underutilized by or have limited success with older Latinos (Mier, Ory, & Medina, 2009; Whaley & Davis, 2007; Dornelas, Stepnowski, Fischer & Thompson, 2007; Staten et al, 2004; Blanco et al, 2007; Cabassa, Zayas & Hansen, 2006; Sentell, Shumway & Snowden, 2007). Similarly, underlying cultural worldviews and experiences may contribute to ethnic group differences in older adults’ participation in leisure activities. For example, compared to Caucasian women, Latinas’ perceptions regarding the expectations to care for aging relatives (Herrera, Lee, Palos, & Torres-Vigil, 2008), and greater religiosity (Navaie-Waliser et al, 2001) would presumably correlate with higher participation in caregiving, religious activities, and family time, and possibly affect the relationship of these activities to depressive symptom burden and cognitive functioning.

This cross-sectional study is the first, to our knowledge, to explore engagement in non-physical leisure and social activities in an older U.S.-based sample of Latinas. The first aim of this study was to identify differences in the frequency of engagement in 16 leisure activities between older Latino and Caucasian women. Secondly, we sought to determine, for each ethnic group, the relationship between individual leisure activities and: (a) depressive symptom severity; and (b) levels of cognitive functioning, after accounting for confounding physical functioning and sociodemographic factors.

Methods

Parent study

The current demographically matched subsample of 113 Latino and Caucasian women each was derived from a larger sample of 6,427 women enrolled in the San Diego clinical center of the Women's Health Initiative (WHI) study, a longitudinal multi-site study examining morbidity and mortality in post-menopausal women (WHI-SG, 1998). Women were followed an average of 7 years between 1994 and 2005. At the completion of the WHI study (2004–06), women were invited to enroll into the Successful Aging Study either face-to-face at their final clinic visit or were mailed the questionnaire and consent form. Ultimately, 30.7% ($n = 1,976$) of the original sample of women age ≥ 60 years were enrolled. Compared with non-respondents, women who completed the mail-in survey were significantly older (by 0.5 years), more likely to be married, and had a higher level of education and income. This study was approved by the Institutional Review Board of the University of California, San Diego.

Study sample

To reduce potential selection bias and maximize the sample, a demographically matched sample of Latino ($n = 113$) and Caucasian ($n = 113$) women was constructed from the larger multi-ethnic Successful Aging Study cohort of 1,976 women. This sample was matched one-to-one according to age, income, educational attainment, and marital status, following the procedures described in the analyses section. Participants from other ethnic minority groups were excluded from this analysis due to disproportionately smaller sample sizes and particular interest in associations between leisure activities and health outcomes among older Latino women.

Measures

Participants completed a modified version of the Cognitive Assessment Screening Test (CAST), a self-administered test, which assesses global cognitive functioning (Drachman & Swearer, 1996; Drachman et al., 1996; Moore et al, 2007). The test consists of three parts, the first two parts identify if the subject's level of cognition falls below the threshold for dementia and the third part assesses the subject's perception of a decline in memory. The tasks in the first two parts involve various cognitive domains including verbal function, visuospatial skills, and memory. As a dementia screening test CAST is at least equal to the Mini-Mental State Exam (MMSE) in psychometric properties and is easier to use in the context of mail-in research surveys as it is self-administered (Drachman et al., 1996). The orientation questions of the CAST were excluded because of possible inaccurate scoring with our method of administration. The CAST was completed by participants, but required a trained rater to evaluate and assign scores. Higher scores correspond with better cognitive functioning.

Depressive symptom severity was assessed using the 20-item Center for Epidemiological Studies Depression Scale (CES-D), a commonly used measure in community samples (Mosciki, Locke, Rae, & Boyd, 1989; Radloff, 1977). Higher scores reflect greater depressive symptom burden. The CES-D demonstrates psychometric validity among Latinos (Cronbach's $\alpha = 0.89$; Chung et al, 2003).

Participants were asked to report how many days they engaged in a range of leisure activities for at least half an hour a day in an average week. Leisure activities included a comprehensive list of 25 common individual and social leisure activities, such as listening to the radio and volunteering, as well as potentially burdensome activities, such as housework and caregiving (see Table 2). These activities were not derived from a previously tested

instrument on leisure activities, but rather were selected according to their merit as potential contributors to successful aging in the current literature. For the present study, we performed a factor analysis to explore the common constituents across the 25 leisure activities, identify correlations between them, and determine if these items could be further collapsed into fewer composite variables. Specifically, we conducted a principal component analysis, applying a Varimax rotation of the 25 leisure activities. Eight factors emerged with eigenvalues of ≥ 1 , together explaining 48.7% of variance, leading us to group certain items together. For example, we created a new composite variable consisting of ‘puzzles’ and ‘reading’, and several other items into a new variable named ‘organized social activities’. When the factor analysis was antithetical or counterintuitive, we elected to err on the conservative side and retain these as individual items. This resulted in a total of 16 total leisure activity classifications used in subsequent analyses. Individual scores ranged from 0 to 7 days per week for each activity.

Although sexual activity has yet to be commonly defined by researchers as a “leisure activity,” in older adults, particularly postmenopausal women, sexual activity is no longer related to procreation and the recent literature suggests it is an important facet of healthy aging (Gott, 2005; Hinchliff & Gott, 2008). Indeed, attitudes towards sex among older adults are changing as society increasingly recognizes that postmenopausal women often still desire and enjoy sexual activity (DeLamater & Sill, 2005; Gott & Hinchliff 2003; Hinchliff & Gott, 2008).

Physical functioning is closely tied to depressive symptoms and cognition (Craft, 2009; Knol et al, 2006; Swartz, Stuss, Gao, & Black, 2008) and consequently moderates older adults’ capacity to engage in certain leisure activities. The physical health composite of the Medical Outcomes Study 36-Item Short Form (SF-36) was used as an indicator of the women’s functional status (Ware, Kosinski, & Keller, 1994). The physical health composite comprises 10 items, with scores ranging from 0 to 100; higher scores indicating greater functioning ($\alpha = .93$; Ware et al., 1994).

Lastly, demographic characteristics considered in this analyses included: age in years (continuous), marital status (1 = never married, 2 = divorced/separated, 3 = widowed, 4 = married, 5 = marriage-like relationship), 10 categories of educational attainment (from ‘no schooling’ to ‘doctoral degree’), 8 categories of annual income (ranging from < \$10,000 to \$150,000+), and ethnicity (Latino or Caucasian).

Analyses

To resolve potential selection bias, the 113 Latino women were matched against the 1,690 Caucasian women by age, education, income, and marital status. Propensity scores were computed by running a logistic regression, in which specified demographic factors predicted ethnic group status (Rosenbaum & Rubin, 1985). The Latino sample was then randomly ordered, each subject then matched to a Caucasian subject by their Mahalanobis distance between propensity scores within a preset caliper.

Using the matched pairs ($n = 226$), we ran descriptive statistics and Student t-tests to describe the demographic profile of the study sample and compare differences in variable means or proportions (Table 1). Significant group differences were not expected, given the preceding purposeful matching.

To test our first hypothesis regarding ethnic group differences in leisure activity participation, we completed a paired Student’s t-test on the matched sample to examine mean differences in the weekly frequency of participation in each leisure activity type between Latino and Caucasian women (Table 2). We then computed Spearman correlations

to explore relationships between each leisure activity type and primary outcomes (depressive symptom burden and cognition), (Table 3). Pattern analyses showed that 16.8% of Latino and 23% of Caucasian women had missing CES-D scores. Thus, maximum likelihood estimation was employed to minimize differential effects stemming from missing data values in analyses involving CES-D.

To examine the relationship between individual leisure activities on depressive symptoms and cognition for each ethnic group, we ran multiple ordinal least square regressions (Table 4). For example, to determine the relationship between a specific leisure activity (e.g. computer use) and cognition on Latino women, our model consisted of one of our dependent variables (cognition or depressive symptom burden) and our primary independent variable (i.e. single leisure activity, such as computer use), adjusting for demographic covariates (age, income, education, and marital status, and physical functioning).

Results

Characteristic of the matched sample of 113 Latina and 113 Caucasian older women are displayed in Table 1. As expected, no significant demographic ethnic group differences were found, given that samples were intentionally matched by these same demographic variables. Women's mean age was 70.08 ($SD = 5.6$). Over half (57%) reported being married or in a marriage-like relationship, and most (91%) had at least a high school education.

Latino women had significantly higher levels of depressive symptom burden ($M = 7.56$; $SD = 7.05$) compared to Caucasian women ($M = 5.26$; $SD = 5.67$), $t(71) = 2.29$, $p = .025$. When CES-D scores are dichotomized along the cut-off at 16, we found that 8.5% ($n = 8$) of Latino women reported CES-D scores ≥ 16 , signifying probable depression, compared with 6.9% ($n = 6$) of Caucasian women. No significant difference between cognitive functioning was observed between Latinas ($M = 17.37$; $SD = 3.56$) and Caucasians ($M = 16.68$; $SD = 4.81$). Physical health composite scores (SF-36) were not significantly different between Latino ($M = 43.75$; $SD = 14.46$) and Caucasian women ($M = 43.54$; $SD = 13.99$).

The frequency of participation in leisure activities by Latino and Caucasian women is displayed in Table 2. Latino and Caucasian women reported similar levels of participation in all of the 16 activities apart from two. Latino women ($M = 1.29$; $SD = 2.33$) were significantly more likely than their Caucasian peers ($M = 0.62$; $SD = 1.67$) to have caregiving responsibilities [$t = 2.13(83)$, $p = .036$]. Latinas ($M = 3.57$; $SD = 2.85$) were also less likely than Caucasian women ($M = 4.50$; $SD = 2.82$) to use computers [$t = -2.36(97)$, $p = .020$].

The results of bivariate analyses to identify any relationships between participation in leisure activities, depressive symptom severity, and cognitive performance by ethnic group are, displayed as Spearman's rho in Table 3, and the significant results are reported here. The analyses indicate that greater participation in organized social activities was significantly associated with lower levels of depressive symptom burden for both Latino ($\rho = -.23$, $p < .05$) and Caucasian women ($\rho = -.22$, $p < .05$). Further, Latino women who listened to the radio more often had fewer depressive symptoms ($\rho = -.24$, $p < .05$). In addition, for Caucasians, sexual activity ($\rho = -.25$, $p < .05$), volunteering ($\rho = -.22$, $p < .05$), and computer activities ($\rho = -.27$, $p < .05$) were correlated with fewer depressive symptoms. Cognition was higher for Latino women reporting higher frequency of reading and doing puzzles ($\rho = .20$, $p < .05$). Housework had negative implications for both Latino and Caucasian women, but on different outcomes. More time spent on housework corresponded with greater depressive symptom burden for Latinas ($\rho = .2$, $p < .05$) and lower cognition for Caucasians ($\rho = -.14$, $p < .05$).

In the linear regression analyses, we modeled individual leisure activities by ethnic group and outcomes, adjusting for selected covariates (e.g. age, physical functioning). Standardized Betas and 95% CIs are shown for individual leisure activities (Table 4), but excluded for covariates. After adjustment for physical functioning and covariates, only listening to the radio was significantly correlated with higher cognition for Caucasian women [$\beta = .23$, CI 95% (.01, .96), $p < .05$]. Bonferroni corrections were used to correct for multiple comparisons. Thus, the significance of the relationship between listening to the radio and cognition for Caucasian women is $p = .01$ (.05/5).

Discussion

This study examined differences in the rate of participation in 16 leisure activities between Latino and Caucasian post-menopausal women, and explored potential relationships of these leisure activities to depressive symptom burden and cognition. Our findings suggest that, after matching our samples on key demographic variables, rates of participation in certain leisure activities are different. Furthermore, we found that purported benefits of leisure activities appear to differ by ethnic group; however, after adjusting for confounding variables (e.g. physical functioning, age), many positive correlations between the activities and depressive symptom burden and cognition were no longer evident.

Our results suggest that Latinas are more likely than Caucasian women to care for elderly or disabled relatives. Older Latinas' greater involvement in caregiving is not surprising as a wealth of literature documents that Latinos are more likely than Caucasians to care for aging and infirm relatives (Mor, Zinn, Angelelli, Teno, & Miller, 2004; Thompson, 2004). This is a trend that depends in large part on culturally held norms, such as *familism*, which motivates family members to care for aging relatives at home (Herrera et al., 2008; Crist, Woo, & Choi, 2007). The time demands of being a caregiver can be quite substantial (Langa, Valenstein, Fendrick, Kabeto, & Vijan, 2004; Langa et al, 2002) and this task is often delegated to females, particularly in Latino cultures (NACE, 2008; Harwood et al., 2000).

Latinas are also less likely to report use of computers than Caucasian women. This is not surprising in light of evidence regarding the digital divide between Latino and non-Hispanic White households (Lorence, Park, & Fox, 2006). Latino and Caucasian women who engage in organized social activities also seem to have a lower depressive symptom burden. However, there are some ethnic differences in the benefits potentially afforded from various types of activities. For instance, Latinas who listen to the radio more often may have fewer depressive symptoms, whereas our data suggest that Caucasians engaging in more frequent sexual activity, volunteering, or computer activities are less likely to report depressive symptoms. As expected, some cognitive activities such as reading and doing puzzles were associated with better cognition, but this was only seen in Latinas. In contrast, older Caucasian women who did less housework had higher levels of cognition.

Our analyses suggest that listening to the radio is associated with a lower level of depressive symptom burden (in the bivariate analyses for Latinas) and better cognitive performance (in the regression model for Caucasians). This corroborates recent findings concerning the benefits of listening to the radio or music (Chan et al., 2009; Gautam, Saito, & Kai, 2007). Interestingly, music and dance have been cited as preferred activities by older Latinos (Chiang, Seman, Belza, & Hsin-Chun Tsai, 2008) and is a prominent theme that emerged in a concurrent qualitative study under peer review by authors XX, XX, and XX. That study found that music and dance are important leisure activities that older Mexican Americans' associate with better emotional health and socialization. An international cross-sectional investigation of older adults also found that listening to the radio correlates with lower rates

of depression (Gautam et al., 2007). These findings are consistent with the positive psychological effects of music therapy in some psychosocial trials among older adults (Meeks, Wetherell, Irwin, Redwin, & Jeste, 2007). The emotional benefit of music and the related physical benefit of dance thus deserve further investigation as a component of lifestyle intervention and/or psychotherapy.

The notion that organized activities are associated with lower depression symptom burden in both Latino and Caucasian women is consistent with some previous literature (Menec, 2003), but casual directionality cannot be inferred from a cross-sectional study. The fact that depressed older adults are less likely to engage in social activities is a core manifestation of depressive illnesses. However, by the same token, increased social support is a robust protective factor against depression in late life (Cole, 2005). The result suggesting that increased sexual activity is associated with less depression in Caucasians is also interesting, but again our study does not allow one to ascribe any direction of causality in this association. The literature on sexual activity and aging is limited, but the increasingly dated and ageist notion that people do not have sex once they reach a certain age because procreation is not possible is fading, and a healthy sex life is indeed important to certain older adults' quality of life (DeLamater & Sill, 2005; Gott & Hinchliff, 2003; Hinchliff & Gott, 2008). Conversely, depression and its pharmacological treatments frequently impair libido and sexual functioning.

Similarly, our findings suggesting that cognitive activities, such as completing puzzles and reading, may promote cognitive health are consistent with longitudinal studies (Wang et al, 2006; Wilson et al, 2002), but caution is warranted in interpreting this finding. Dementia often has a prodromal phase (Small, Fratiglioni, Viitanen, Winblad & Backman, 2005) linked to decreased participation in leisure activities, perhaps because of depression, apathy, or subtle cognitive challenges of the activities. Despite the limitations of inferring causality in the significant associations from our study, such cross-sectional data inform potentially fruitful future prospective investigations. Indeed, future longitudinal studies would be needed to validate the relationships suggested by this study.

Other limitations of this study include its reliance on self-administered survey data, and exclusive enrollment of English-speaking women. Furthermore, the rate of participation was approximately one-third of potential local WHI participants. Nonetheless, to our knowledge, no prior study has examined leisure activities alongside emotional health and cognition in this population, and these results form a foundation for future prospective research on leisure activities and their effects on neuropsychiatric health among older Latinos.

The category of ethnicity in this sample represents a heterogeneous group of Latinas that may disguise important cultural differences based on country of origin, migration histories, and levels of acculturation. Further, this group of Latina women, for instance, had unexpectedly low rates of depressive symptoms (8% with CESD ≥ 16), compared to community estimates of depression in the general population of older Latinas (24–39%). However, sociodemographic variables were closely examined prior to any analyses and matching Latino and Caucasian women on key sociodemographic variables reduces potential selection bias, and lends strength to this study's findings.

Lastly, a challenging aspect of this study is the accurate and reliable measurement of leisure activities in what is still considered a relatively new science. Investigators recognize the multidimensional components (e.g., emotional, social, cognitive) of any single leisure activity, but guidelines for categorizing and measuring leisure activities remain in need of more reliable standards.

Conclusion

Patterns of leisure activity participation among older Latinas have received little empirical research, leaving several unanswered questions regarding the potential for these activities to promote more successful physical, emotional, and cognitive aging. Future prospective research should explore whether leisure activity-based interventions among older Latinos (including men) could result in improved cognitive and emotional health outcomes, and take into account potential preferences in activities by ethnic group.

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References

- American Heart Association (AHA). Heart disease and stroke statistics—2008: A report from the American Heart Association statistics committee and stroke statistics. *Circulation*. 2008; 117:e25–146. [PubMed: 18086926]
- Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: A meta-analysis. *Diabetes Care*. 2001; 24:1069–1078. [PubMed: 11375373]
- Angel, J.; Whitfield, K. Setting the stage: Hispanic health and aging in the Americas. In: Angel, Jacqueline L.; Whitfield, Keith E., editors. *The health of aging Hispanics: The Mexican-origin population*. New York, NY: Springer Publishing; 2007. p. 263-279.
- Bartels SJ, Coakley EH, Zubritsky C, Ware JH, Miles KM, Arian PA, ...Levkoff SE. Improving access to geriatric mental health services: A randomized trial comparing treatment engagement with integrated versus enhanced referral care for depression, anxiety, and at-risk alcohol use. *American Journal of Psychiatry*. 2004; 161(8):1455–1462. [PubMed: 15285973]
- Blake H. How effective are physical activity interventions for alleviating depressive symptoms in older people? A systematic review. *Clinical Rehabilitation*. 2009; 23:873–887. [PubMed: 19675114]
- Blanco C, Patel SR, Liu L, Jiang H, Lewis-Fernández R, Schmidt AB, Olfson M. National trends in ethnic disparities in mental health care. *Medical Care*. 2007; 45(11):1012–1019. [PubMed: 18049340]
- Cabassa LJ, Zayas LH, Hansen MC. Latino adults' access to mental health care: a review of epidemiological studies. *Administration and Policy in Mental Health*. 2006; 33(3):316–330. [PubMed: 16598658]
- Cernin PA, Lichtenberg PA. Behavioral treatment for depressed mood: A pleasant events intervention for seniors residing in assisted living. *Clinical Gerontologist*. 2009; 32(3):324–331.
- Chan MF, Chan EA, Mok E, Tse K, Yuk F. Effect of music on depression levels and physiological responses in community-based older adults. *International Journal of Mental Health Nursing*. 2009; 18(4):285–294. [PubMed: 19594648]
- Chapman DP, Williams SM, Strine TW, Anda RF, Moore MJ. Dementia and its implications for public health. *Prevention and Chronic Disease*. 2006; 3(2):A34.
- Chiang K, Seman L, Belza B, Hsin-Chun Tsai J. "It is our exercise family": Experiences of ethnic older adults in a group-based exercise program. *Preventing Chronic Disease*. 2008; 5(2):A70.

- Chung H, Teresi J, Guarnaccia P, Meyers B, Holmes D, Bobrowitz T, ...Ferran E Jr. Depressive symptoms and psychiatric distress in low income Asian and Latino primary care patients: Prevalence and recognition. *Community Mental Health Journal*. 2003; 39(1):33–46. [PubMed: 12650554]
- Cole M. Evidence-based review of risk factors for geriatric depression and brief preventive interventions. *Psychiatric Clinics of North America*. 2005; 28(4):785–803. [PubMed: 16325729]
- Craft S. The role of metabolic disorders in Alzheimer disease and vascular dementia: Two roads converged. *Archives of Neurology*. 2009; 66(3):300–305. [PubMed: 19273747]
- Cress ME, Buchner DM, Prohaska T, Rimmer J, Brown M, Macera C, Chodzko-Zajko W. Best practices for physical activity programs and behavior counseling in older adult populations. *European Review of Aging and Physical Activity*. 2005; 3(1):34–42.
- Crist J, Woo S, Choi M. A comparison of the use of home care services by Anglo- American and Mexican American elders. *Journal of Transcultural Nursing*. 2007; 4:339–348. [PubMed: 17911574]
- DeLamater JD, Still M. Sexual desire in later life. *The Journal of Sex Research*. 2005; 42(2):138–149.
- Dornelas E, Stepnowski R, Fischer E, Thompson P. Urban ethnic minority women's attendance at health clinic vs. church based exercise programs. *Journal of Cross-Cultural Gerontology*. 2007; 22(1):129–136. [PubMed: 17131182]
- Drachman DA, Swearer JM, Kane K, Osgood D, O'Toole C, Moonis M. The cognitive assessment screening test (CAST) for dementia. *Journal of Geriatric Psychiatry and Neurology*. 1996; 9:200–208. [PubMed: 8970013]
- Drachman DA, Swearer JM. Screening for dementia: Cognitive assessment screening test (CAST). *American Family Physician*. 1996; 54(6):1957–1962. [PubMed: 8900355]
- Gallagher-Thompson D, Solano N, Coon D, Arean P. Recruitment and retention of Latino dementia family caregivers in intervention research: Issues to face, lessons to learn. *The Gerontologist*. 2003; 43:45–51. [PubMed: 12604745]
- Garcia-Martin MA, Gomez-Jacinto L, Martimortugues-Goyenechea C. A structural model of the effects of organized leisure activities on the well-being of elder adults in Spain. *Activities, Adaptation & Aging*. 2004; 28(3):19–34.
- Gautam R, Saito T, Kai I. Leisure and religious activity participation and mental health: Gender analysis of older adults in Nepal. *BMC Public Health*. 2007; 7:299. [PubMed: 17953749]
- Gott, M. Sexuality, sexual health and aging. Berkshire, UK: Open University Press; 2005.
- Gott M, Hinchliff S. How important is sex in later life? The views of older people. *Social Science & Medicine*. 2003; 56(8):1617–1628. [PubMed: 12639579]
- Haan MN, Mungas DM, Gonzalez HM, Ortiz TA, Acharya A, Jagust WJ. Prevalence of dementia in older Latinos: The influence of type 2 diabetes mellitus, stroke, and genetic factors. *Journal of the American Geriatric Society*. 2003; 51(2):169–177.
- Harwood DG, Barker WW, Ownby RL, Bravo M, Agüero H, Duara R. Predictors of positive and negative appraisal among Cuban American caregivers of Alzheimer's disease patients. *International Journal of Geriatric Psychiatry*. 2000; 15(6):481–487. [PubMed: 10861912]
- Herrera A, Lee J, Palos G, Torres-Vigil I. Cultural influences in the patterns of long-term care use among Mexican-American family caregivers. *Journal of Applied Gerontology*. 2008; 27:141–165.
- Hertz R, Unger A, Ferrario C. Diabetes, hypertension, and dyslipidemia in Mexican Americans and non-Hispanic whites. *American Journal of Preventive Medicine*. 2006; 30(2):103–110. [PubMed: 16459207]
- Hinchliff S, Gott M. Challenging social myths and stereotypes of women and aging: Heterosexual women talk about sex. *Journal of Women & Aging*. 2008; 20(1):65–81. [PubMed: 18581701]
- Jeste D, Alexopoulos G, Bartels S, Cummings J, Gallo J, Gottlieb G, Lebowitz BD. Consensus statement on the upcoming crisis in geriatric mental health: Research agenda for the next 2 decades. *Archives of General Psychiatry*. 1999; 56(9):848–853. [PubMed: 12884891]
- Knol MJ, Twisk JWR, Beekman ATF, Heine RJ, Snoek FJ, Pouwer F. Depression as a risk factor for the onset of type 2 diabetes mellitus. A meta-analysis. *Diabetologia*. 2006; 49:837–845. [PubMed: 16520921]

- Langa K, Valenstein M, Fendrick A, Kabeto M, Vijan S. Extent and cost of informal caregiving for older Americans with symptoms of depression. *American Journal of Psychiatry*. 2004; 161:857–863. [PubMed: 15121651]
- Langa K, Vijan S, Hayward R, Chernew M, Blaum C, Kabeto M, Fendrick AM. Informal caregiving for diabetes and diabetic complications among elderly Americans. *Journals of Gerontology Series B: Psychological & Social Sciences*. 2002; 57(3):S177–S186.
- Larson E, Wang L, Bowen J, McCormick W, Teri L, Crane P, Kukull W. Exercise is associated with reduced risk for incident dementia among persons 65 years and older. *Annals of Internal Medicine*. 2006; 144(2):73–81. [PubMed: 16418406]
- Lorence DP, Park H, Fox S. Racial disparities in health information access: resilience of the digital divide. *Journal of Medical Systems*. 2006; 30(4):241–249. [PubMed: 16978003]
- Meeks T, Wetherell J, Irwin M, Redwin L, Jeste D. Complementary and alternative treatments for late-life depression, anxiety, and sleep disturbance: A review of randomized controlled trials. *Journal of Clinical Psychiatry*. 2007; 68(10):1461–1471. [PubMed: 17960959]
- Menec VH. The relation between everyday activities and successful aging: a 6-year longitudinal study. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2003; 58(2):S74–82.
- Mier N, Ory MG, Medina AA. Anatomy of culturally sensitive interventions promoting nutrition and exercise in Hispanics: A critical examination of existing literature. *Health Promot Pract*. 2009 Feb 4. [Epub ahead of print].
- Moore D, Sitzer D, Depp C, Montross L, Reichstadt J, Lebowitz B, Jeste D. Self-administered cognitive screening for a study of successful aging among community-dwelling seniors: A preliminary study. *International Journal of Geriatric Psychiatry*. 2007; 22:327–331. [PubMed: 17096466]
- Mor V, Zinn J, Angelelli J, Teno J, Miller S. Driven to tiers: Socioeconomic and racial disparities in the quality of nursing home care. *The Milbank Quarterly*. 2004; 82:227–256. [PubMed: 15225329]
- Moscicki EK, Locke BZ, Rae DS, Boyd JH. Depressive symptoms among Mexican Americans: The Hispanic health and nutrition examination survey. *American Journal of Epidemiology*. 1989; 130(2):348–360. [PubMed: 2750730]
- Musick MA, Wilson M. Volunteering and depression: the role of psychological and social resources in different age groups. *Social Science and Medicine*. 2003; 56:259–269. [PubMed: 12473312]
- National Alliance on Caregiving (NAC) and Evercare. Tech rep. National Alliance on Caregiving (NAC) and Evercare; 2008. Evercare study of Hispanic family caregiving in the U.S.: Findings from a national study. Retrieved Jan 5, 2010 from: <http://evercarehealthplans.com/pdf/HispanicCaregiversStudy.pdf>
- Navaie-Waliser M, Feldman P, Gould D, Levine C, Kuerbis A, Donelan K. The experiences and challenges of informal caregivers: Common themes and differences among Whites, Blacks, and Hispanics. *The Gerontologist*. 2001; 41(6):733–741. [PubMed: 11723341]
- Pratt L, Brody D. Depression in the United States household population, 2005–2006. *NCHS Data Brief*. 2008; (7):1–8. [PubMed: 19389321]
- Pressman SD, Matthews KA, Cohen S, Martire LM, Scheier M, Baum A, Schulz R. Association of enjoyable leisure activities with psychological and physical well-being. *Psychosomatic medicine*. 2009; 71(7):725–732. [PubMed: 19592515]
- Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 3:385–401.
- Raji MA, Reyes-Ortiz CA, Kuo YF, Markides KS, Ottenbacher KJ. Depressive symptoms and cognitive change in older Mexican Americans. *Journal of Geriatric Psychiatry and Neurology*. 2007; 20(3):145–152. [PubMed: 17712097]
- Rosenbaum PR, Rubin DB. Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*. 1985; 39:33–38.
- Sentell T, Shumway M, Snowden L. Access to mental health treatment by English language proficiency and race/ethnicity. *Journal of General Internal Medicine, Supplement*. 2007; 2:289–293.

- Small B, Fratiglioni, Viitanen M, Winblad B, Backman L. The course of cognitive impairment in preclinical Alzheimer disease: Three- and six-year follow-up of a population base sample. *Archives of Neurology*. 2005; 57:839–844. [PubMed: 10867781]
- Staten L, Gregory-Mercado K, Ranger-Moore J, Will JC, Giuliano AR, Ford ES, Marshall J. Provider counseling, health education, and community health workers: The Arizona WISEWOMAN project. *Journal of Women's Health*. 2004; 13(5):547–556.
- Street G, James R, Cutt H. The relationship between organized physical recreation and mental health. *Health Promotion Journal of Australia*. 2007; 18(3):236–239. [PubMed: 18201167]
- Strohle A. Physical activity, exercise, depression and anxiety disorders. *Journal of Neural Transmission*. 2009; 116:777–784. [PubMed: 18726137]
- Swartz RH, Stuss DT, Gao F, Black SE. Independent cognitive effects of atrophy and diffuse subcortical and thalamico-cortical cerebrovascular disease in dementia. *Stroke*. 2008; 39(3):822–830. [PubMed: 18258840]
- Thoits PA, Hewitt LN. Volunteer work and well-being. *Journal of Health and Social Behavior*. 2001; 42(2):115–131. [PubMed: 11467248]
- Thompson, L. Tech rep. Washington, DC: Georgetown University Long-Term Care Financing Project; 2004. Support for family caregivers [issue brief].
- U.S. Census Bureau. The older population in the United States March 2002. 2003. Retrieved October 20, 2009 from: <http://www.census.gov/prod/2003pubs/p20-546.pdf>
- U.S. Census Bureau. American Community Survey (ACS). 2006. Retrieved January 21, 2010, from: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=01000US&-ds_name=ACS_2006_EST_G00_&-_lang=en&-_caller=geoselect&-redoLog=true&-format=
- Wang JY, Zhou DH, Li J, Zhang M, Deng J, Tang M, Chen M. Leisure activity and the risk of cognitive impairment: the Chongqing aging study. *Neurology*. 2006; 66(6):911–913. [PubMed: 16291928]
- Ware, JE.; Kosinski, M.; Keller, SK. *SF-36® Physical and Mental Health Summary Scales: A User's Manual*. Boston, MA: The Health Institute; 1994.
- Whaley AL, Davis KE. Cultural competence and evidence-based practice in mental health services: a complementary perspective. *The American Psychologist*. 2007; 62(6):563–574. [PubMed: 17874897]
- Wilson RS, Mendes de Leon CF, Barnes LL, Schneider JA, Evans DA, Bennett DA. Participation in cognitively stimulating activities and the risk of incident Alzheimer's disease. *Journal of the American Medical Association*. 2002; 287:742–748. [PubMed: 11851541]
- Women's Health Initiative Study Group (WHI-SG). Design of the Women's Health Initiative clinical trial and observational study. *Control Clinical Trials*. 1998; 19:61–109.
- Zimmerman J, Mast B, Miles T, Markides K. Vascular risk and depression in the Hispanic Established Population for the Epidemiologic Study of the Elderly (EPESE). *International Journal of Geriatric Psychiatry*. 2009; 24(4):409–416. [PubMed: 18821725]

Table 1

Sociodemographic characteristics of matched samples of post-menopausal Latino and Caucasian women (n = 113 each)

	Latino N (% or S.D)	Caucasian N (% or S.D)	Total Sample N (% or S.D)
	113	113	226
Age (mean $\pm$ SD)	70.04 (7.2)	70.16 (7.2)	70.08 (5.6)
Marital status			
Never married	0 (0)	5 (4.4)	5 (2)
Divorced/separated	35 (31.0)	25 (21.9)	60 (27)
Widowed	15 (13.3)	16 (14.0)	31 (14)
Married	60 (53.1)	61 (53.5)	121 (54)
Living in marriage-like relationship	3 (2.7)	4 (3.5)	7 (3)
Education			
No school	1 (.9)	1 (.9)	2 (1)
Grade school (5–8 yrs)	6(5.3)	0 (0)	6 (3)
Some H.S. (9–11 yrs)	7 (6.2)	5 (4.4)	12 (5)
H.S. diploma/GED	13(11.5)	16 (14.0)	29 (13)
Vocational training	9(8.0)	12 (10.5)	21 (9)
Some college/Assoc degree	40(35.4)	45 (39.5)	85 (38)
Bachelor's	11(9.7)	11 (9.6)	22 (10)
Some professional school after			
College graduation	13(11.5)	7 (6.1)	20 (9)
Master's degree	10(8.8)	14 (12.3)	24 (11)
Doctoral degree	3(2.7)	0 (0)	3 (1)
Annual income (\$)			
< 10,000	15 (13.4)	11 (9.6)	26 (12)
10,000–19,999	15 (13.4)	7 (6.1)	22 (10)
20,000–34,999	20 (17.9)	22 (19.3)	42 (20)
35,000–49,999	15 (13.4)	24 (21.1)	39 (18)
50,000–74,999	22 (19.6)	26 (22.8)	48 (22)
75,000–99,999	12 (10.7)	7 (6.1)	19 (9)
100,000–149,999	7 (6.3)	6 (5.3)	13 (6)
150,000 +	2 (1.8)	3 (2.6)	5 (2)

Table 2
Differences in frequency of participation in leisure activities in matched sample of Latino and Caucasian women (n = 113 each)

	Latino		Caucasian		paired t-test	
	n = 113		n = 113		t	p-value
	Mean	SD	Mean	SD		
Radio	4.12	2.89	4.51	2.75	-0.88	.38
Television	6.04	1.75	6.08	1.76	-0.16	.88
Caregiving*	1.29	2.33	0.62	1.67	2.13	.04
Sexual Activity	0.51	1.05	0.47	0.99	0.22	.83
Writing	2.44	2.52	2.38	2.41	0.16	.87
Computer*	3.57	2.85	4.50	2.82	-2.36	.02
Reading and puzzles	3.98	1.75	4.08	1.71	-0.43	.67
Visiting with Friends	1.89	1.83	2.24	1.78	-1.27	.21
Organized Social	1.04	1.27	1.27	1.53	-1.16	.25
Activities						
Artwork	0.95	1.99	0.74	1.60	0.81	.42
Games	0.43	1.10	0.49	1.07	-0.40	.69
Classes	0.62	1.11	0.63	0.98	-0.07	.95
Religious	1.56	1.91	1.42	2.07	0.48	.64
Volunteering	1.00	1.62	1.31	1.67	-1.28	.20
Visiting with Family	3.68	3.69	2.85	3.03	1.53	.13
Housework	4.84	2.38	4.55	2.54	0.86	.39

*
p < .05

Table 3

Spearman's rho correlational analyses of leisure activities, depressive symptom severity, and cognitive performance by ethnic group (total n = 226)

	Depressive symptom severity ^a		Cognitive performance ^b	
	Caucasian	Latino	Caucasian	Latino
Radio	.12	-.24*	.02	-.05
Television	-.01	.01	-.03	-.10
Caregiving	-.13	.04	-.12	.10
Sexual Activity	-.25*	.01	.07	.05
Writing	-.07	-.05	.04	-.05
Computer	-.27*	-.14	.04	.17
Reading and puzzles	-.14	-.02	.22	.20*
Visiting with Friends	-.08	-.15	-.22*	.07
Organized Social Activities	-.23*	-.22*	-.04	.14
Artwork	-.13	.00	-.05	.18
Games	-.13	.06	-.06	-.06
Classes	-.17	-.16	-.00	.09
Religious	-.21	-.06	-.10	-.13
Volunteering	-.22*	-.21	.03	.09
Visiting with Family	.14	-.02	-.11	.05
Housework	.07	.21*	-.14*	-.18

*
p < .05

^a measured with Center for Epidemiological Studies Depression scale;

^b measured with Cognitive Assessment Screening Test

Unstandardized values from linear regression analyses examining the association between leisure activity type and mental health outcomes (depressive symptom severity and cognitive performance) in Latino and Caucasian women (n = 113 each)

Table 4

Leisure activity	Depressive symptoms ^a				Cognitive performance ^b			
	Latino		Caucasian		Latino		Caucasian	
	B	95% CI	B	95% CI	β	95% CI	β	95% CI
Radio	-.17	(-0.85, 0.08)	.17	(-0.11, 0.81)	-.17	(-0.44, 0.04)	.23*	(0.01, 0.96)
Television	.09	(-0.40, 1.0)	-.02	(-0.85, 0.73)	-.11	(-0.57, 0.16)	-.14	(-0.95, 0.67)
Caregiving	.03	(-0.56, 0.62)	-.08	(-1.1, 0.53)	.16	(-0.07, 0.55)	-.09	(-1.10, 0.49)
Sexual activity	.01	(-1.5, 1.6)	-.15	(-2.7, 0.47)	.02	(-0.66, 0.77)	-.12	(-2.46, 0.78)
Writing	-.19	(-0.22, 0.01)	.01	(-0.51, 0.56)	.02	(-0.47, 0.59)	-.04	(-0.61, 0.46)
Computer	.27	(-0.29, 0.84)	-.12	(-0.71, 0.21)	.11	(-0.15, 0.40)	-.14	(-0.75, 0.19)
Reading and puzzles	.03	(-0.26, 0.33)	-.06	(-0.32, 0.19)	0	(-0.15, 0.15)	-.10	(-0.35, 0.15)
Visiting with friends	-.15	(-1.30, 0.15)	.01	(-0.71, 0.74)	.02	(-0.32, 0.40)	.04	(-0.59, 0.86)
Organized social activities	-.15	(-1.80, 0.25)	-.13	(-1.3, 0.33)	.05	(-0.39, 0.66)	-.10	(-1.16, 0.46)
Artwork	-.10	(-1.00, 0.31)	-.08	(-0.96, 0.46)	.14	(-0.12, 0.57)	-.06	(-0.87, 0.52)
Games	.05	(-1.10, 1.80)	-.06	(-1.90, 1.10)	.02	(-0.61, 0.75)	-.05	(-1.8, 1.14)
Classes	-.07	(-1.60, 0.74)	-.05	(-1.60, 1.10)	-.12	(0.99, 0.23)	-.04	(-1.55, 1.06)
Religious	-.05	(-0.82, 0.48)	-.13	(-1.0, 0.26)	-.13	(-0.60, 0.11)	-.11	(-0.94, 0.34)
Volunteering	-.09	(-1.2, 0.49)	-.07	(-1.0, 0.55)	.03	(-0.37, 0.50)	-.08	(-1.07, 0.53)
Visiting with family	-.02	(-0.39, 0.31)	.16	(-0.12, 0.72)	.03	(-0.16, 0.22)	.18	(-0.10, 0.74)
Housework	.07	(-0.33, 0.71)	.15	(-0.09, 0.50)	-.04	(-0.32, 0.21)	.15	(-0.10, 0.49)

* $p < .0$

^a measured with Center for Epidemiological Studies Depression scale

^b measured with Cognitive Assessment Screening Test

Note: Controls are age, education, income, marital status, and physical functioning (omitted from the table).