



Social Engagement and Cognitive Function Among Older Mexican Heritage Latinos

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ABSTRACT

Objectives: The current study examined the relationship between social engagement and cognitive function among older Mexican heritage Latinos in the U.S. Although social engagement has been identified as a factor that is protective against cognitive decline and dementia, its association with cognitive health in Mexican heritage Latinos is understudied.

Methods: Data on cognitive health, social network characteristics, perceived social support, and social engagement were collected in a sample of older Mexican heritage Latinos in South Texas.

Results: Social network characteristics, perceived social support, and social engagement were significantly correlated with cognitive health. A hierarchical multiple regression analysis was used to test the relative strength of these factors in predicting cognitive health, while controlling for relevant covariates. Social engagement was found to be a significant predictor of cognitive function, beyond the effects of perceived social support and social network characteristics.

Conclusions: Findings highlight social engagement as a modifiable behavioral factor that may support cognitive health in aging Mexican heritage Latinos.

Clinical Implications: The results suggest that screening for and enhancing social engagement may be a valuable clinical strategy for preserving cognitive function in older Latinos at risk of poor cognitive health outcomes.

KEYWORDS

Alzheimer's disease and related dementias; cognitive function; Mexican heritage Latinos; social engagement

Introduction

The older adult population in the U.S. is projected to grow substantially, increasing from 15% in 2016 to 20% in 2030 (Vespa et al., 2020). As the population ages, the number of individuals with Alzheimer's disease and related dementias (ADRD) is also expected to grow. Although normal aging may involve mild cognitive declines, most older adults will not develop ADRD (Harada et al., 2013). For those who do, mild cognitive impairment often precedes dementia, which is diagnosed when cognitive deficits interfere with daily functioning (Gauthier et al., 2006; Hugo & Ganguli, 2014). However, vulnerability to cognitive decline varies, partly due to differences in cognitive reserve – the brain's capacity to compensate for damage while maintaining function (Stern et al., 2020). Education, occupational complexity, social and cognitive activity, and physical exercise contribute to this reserve (Stern et al., 2020). Given the rapid growth of the aging population and the burden of ADRD, there is an urgent

need to promote modifiable lifestyle interventions that may help preserve cognitive function.

ADRD in older U.S. Latinos

The older Latino population in the U.S. is growing at a faster rate than the non-Hispanic White population. It is projected to make up 21% of the older adult population by 2060, up from 9% in 2019 (Administration for Community Living, 2021). Compared to non-Latino Whites, Latinos in the U.S. experience a 1.5 to 2 times higher prevalence of ADRD (Gurland et al., 1999; Kornblith et al., 2022). ADRD rates are also higher among Latinos compared to other racial and ethnic groups in the U.S. For example, A 10-year longitudinal study of 1.9 million older adults receiving care in veterans' hospitals found that the age-adjusted incidence of dementia was approximately 20 cases per 1,000 person-years among Hispanic and African American participants, compared to fewer than 13 cases per

1,000 person-years among Asian and non-Hispanic White participants (Kornblith et al., 2022).

In addition to the higher prevalence of ADRD, Latinos also have an earlier onset of dementia than non-Latino Whites, with cognitive impairment occurring an average of seven years earlier (Clark et al., 2005). A community-based study investigating characteristics associated with mild cognitive impairment (MCI) among Mexican Americans and non-Latino Whites found that the average onset age of MCI was 64 years for Mexican Americans and 71 years for non-Latino Whites (O'Bryant et al., 2021).

Mexican heritage Latinos, who make up the largest U.S. Latino subgroup (and made up almost 62% of the U.S. Latino population in 2020; U.S. Census Bureau, 2021), exhibit disproportionately high rates of obesity, type 2 diabetes mellitus (T2DM), metabolic syndrome, and cardiovascular disease (CVD) relative to non-Latino White individuals (Gonzalez-Guarda et al., 2013; Heiss et al., 2014; Shai et al., 2006; Vega et al., 2009). Elevated rates of cardiometabolic abnormalities, which include insulin resistance, adiposity, hyperglycemia, hyperlipidemia, elevated blood pressure, and a sustained, mild proinflammatory profile (Hossain et al., 2007), are common across Latino subgroups. In one large study, metabolic syndrome prevalence was highest among Puerto Rican (37.1%), followed by Mexican American (35.0%) and Cuban American (34.8%) adults (Heiss et al., 2014). Complementary findings from a nationally representative U.S. survey showed that T2DM was most prevalent among Mexican heritage individuals (24.7%), compared to 21.7% in Puerto Rican, 20.5% in Cuban/Dominican, 20.4% in Black, and 12.1% in non-Latino White adults (Cheng et al., 2019). These cardiometabolic conditions elevate risk for cognitive impairment (Downer et al., 2020) and contribute to subgroup differences in ADRD etiology. For example, dementia risk was nearly eightfold higher among Latinos with both T2DM and cerebrovascular disease (Haan et al., 2003). Whereas ADRD among non-Latino Whites is primarily Alzheimer's type, vascular dementia is more common among Mexican heritage Latinos due to higher rates of T2DM and stroke (Filshtein et al., 2019; Schneider et al., 2007). The rapid

growth of the older Mexican heritage population, combined with their disproportionate burden, earlier onset of ADRD, and barriers to healthcare access (Escarce & Kapur, 2006), underscores the urgent need for culturally tailored, accessible, non-pharmacologic dementia prevention strategies for older Latinos with Mexican heritage.

Social relationships and cognitive health

Research on social relationships and cognitive function among older adults reveals that the presence of social relationships is linked to better cognitive health, while a lack of social relationships is associated with an increased risk of poor cognitive functioning (Barnes et al., 2004; Kelly et al., 2017; Sharifian et al., 2019). Social relationships support cognitive health in later life by promoting cognitive stimulation, which contributes to the development of cognitive reserve (Scarmeas & Stern, 2003). Studies on social relationships and cognitive health encompass those that examine various aspects of social relationships, including social networks, social support, and social engagement (Kelly et al., 2017; Perry et al., 2021).

Social networks refer to an individual's system of social relationships and can be characterized by size, density, and frequency of contact (Berkman et al., 2000). Social support includes perceived social support, received assistance, and network integration (Antonucci, 1990). Perceived social support – an individual's appraisal of being cared for and having access to support when needed – is the most widely established social support construct (Barrera, 1986). In contrast, social engagement is defined as active participation and interaction with others, encompassing both formal and informal social activities (Bassuk et al., 1999). Social networks, social support, and social engagement represent distinct yet frequently co-occurring constructs. Additionally, evidence suggests they are differentially associated with distinct cognitive health domains. According to Berkman et al.'s social network theory of health (2000), social networks influence health outcomes indirectly by providing the structural context for psychosocial mechanisms – such as social support and social engagement – that have more direct effects on health.

The presence of large social networks is related to the maintenance of cognitive function in older adulthood. This association can be better understood through social network theory (Berkman et al., 2000), which posits that social networks influence health outcomes – including cognitive health – through four primary psychosocial mechanisms: the provision of social support; the exertion of social influence; social engagement and emotional connection; and access to material goods and resources. These mechanisms, in turn, affect health through behavioral (e.g., smoking, diet, and physical activity), psychological (e.g., stress buffering), and physiological (e.g., cardiovascular reactivity) pathways. Research examining social network characteristics and cognitive health in older adults demonstrates that larger social networks and greater connectedness are associated with better cognitive health outcomes compared to smaller networks and weaker connectedness (Perry et al., 2021). Findings from longitudinal population-based studies suggest that larger social networks are associated with higher cognitive functioning over time. For example, Holtzman et al. (2004) demonstrated that larger social networks at baseline were associated with better global cognition scores and reduced odds of cognitive decline at a 12-year follow-up in a community-based cohort of adults over the age of 50. Another study examined five types of social networks – children, other relatives, friends, confidants, and overall social networks – in cognitively normal individuals and found that having larger friend-based and overall social networks were prospectively associated with better episodic memory at a 15-year follow-up (Giles et al., 2012).

Perceptions of social support in older adulthood are also associated with better cognitive function, and there is considerable evidence that a lack of perceived support can lead to impaired cognitive health. According to the main effects model of social support, social support directly promotes health, particularly when individuals are facing stressors (Cohen & Wills, 1985). Longitudinal research provides support for the notion that higher baseline perceptions of support are associated with better cognitive health over time. A systematic review on social relationships and cognitive function among healthy older adults

found that greater emotional support was prospectively linked with better functioning in various cognitive domains, including general cognition, reasoning, and processing speed, over follow-up periods ranging from five to fourteen years (Kelly et al., 2017). In a prospective population-based study of Latinos, individuals with higher levels of perceived social support at baseline experienced less pronounced declines in verbal memory over the 7-year follow-up period (Estrella et al., 2024). In a longitudinal study of Mexican Americans, individuals with low perceived emotional social support at baseline were more likely to fall into the increasing dementia risk group (49.1%) than those with high support (36.9%) after 15 years. Conversely, those with high support were nearly twice as likely to remain unimpaired (19.5% vs. 10.3%; Rote et al., 2021).

Of the three social relationship variables, social engagement may be the most critical for cognitive health, consistently showing substantial benefits. Several prospective studies support the causal link between greater social engagement and positive cognitive health outcomes. In one longitudinal study examining social participation in older adults at baseline and cognitive health six years later, higher levels of social engagement were found to be protective of memory and executive functions at follow-up (Bourassa et al., 2017). Based on the results of their study, the researchers concluded that social participation had at least as large an effect, if not a larger one, than other potential cognitive health intervention targets, such as depression and physical activity. A systematic review conducted to synthesize the results of research on various aspects of social relations, including social engagement, found that greater social engagement was significantly prospectively associated with better cognitive functioning, especially global cognition, across 20 out of 22 included studies (Kelly et al., 2017). In addition, Ihle et al. (2021) found that social engagement is the mechanism linking social networks to change in executive function over time, which aligns with social network theory (Berkman et al., 2000), suggesting that social engagement is a key proximal factor influencing health, with social networks serving as more distal influences. The findings that social engagement (as opposed to disengagement) is beneficial to

cognitive health are so robust that they have recently been added to the list of recommended behavioral interventions that can be used to effectively reduce the risk of cognitive decline (Dause & Kirby, 2019).

According to the revised Scaffolding Theory of Aging and Cognition (Reuter-Lorenz & Park, 2014), social engagement activities, along with leisure and cognitive engagement activities, directly contribute to brain health by actively enriching neural resources. Neural enrichment resources stimulate and strengthen neural connections, contributing to healthy aging by building a reserve of cognitive networks that can maintain cognitive function despite normal age-related cognitive decline (Oosterhuis et al., 2023). Evidence regarding the mechanisms by which resources such as social engagement influence cognitive health includes structural findings demonstrating enhanced gray matter integrity in brain regions relevant to social cognition (Felix et al., 2021) and reduced neuroinflammation, thereby preserving overall brain integrity (Smith et al., 2018).

Social relationships among Latinos

The examination of the role of social relationships on cognitive health is particularly relevant to study among Latinos. The well-being of Latinos is closely tied to their social support network, which is deeply shaped by cultural values, such as familism. Familism, a defining feature of Latino culture, emphasizes loyalty, interdependence, and the primacy of the family (Sabogal et al., 1987). Within this framework, family members are often the primary source of emotional and instrumental support, and obligations to kin are considered central to one's well-being (Sabogal et al., 1987; Vega & Zambrana, 1995). Social support has been found to buffer the adverse effects of stress on health among Mexican Americans but not among other racial and ethnic groups, suggesting that culturally embedded norms of horizontal collectivism (which emphasize sociability and reciprocity) in Latin American culture may underlie this pattern (Shavitt et al., 2016).

Beyond the family context, patterns of social engagement among Latinos further illustrate how cultural and structural factors shape opportunities for connection. Latinos report higher levels of

interaction with immediate family members compared to non-Latino Whites but lower engagement with friends and non-relatives in the community, a pattern that has been linked to older age, higher depressive symptoms, and a greater number of health conditions (Rodriguez-Galan & Falcon, 2010). Using nationally representative data, Latinos were also found to engage less than non-Hispanic Whites on general measures of social engagement that include interactions with both family and friends (Quach et al., 2021). Consistent with these national patterns, a Texas-based study of adults aged 60 and older, 43.2% of Latinos reported volunteering compared to 56.4% of non-Latino adults, with Latinos less likely to participate in formal volunteering but more likely to engage in informal helping and caregiving roles (Ahn et al., 2011). In this study, volunteering was positively associated with religious involvement and inversely associated with financial resources. Together, these findings suggest that while social engagement is culturally embedded and often family-centered among Latinos, structural and socioeconomic factors may constrain broader engagement opportunities that are critical for maintaining cognitive and emotional well-being in later life.

Although existing research supports the substantial benefits of social engagement for cognitive health in non-Latino older adults, research examining the role of social engagement among Mexican heritage Latinos remains scarce, making it difficult to determine whether patterns observed in other populations hold true for this group. To our knowledge, there is only one published study (Aguilar et al., 2024) in a cohort of Mexican Americans aged 65 and older, which reported that, among several indicators of social engagement, only the frequency of contact with family decreased the likelihood of developing dementia over a seven-year follow-up period. Further, no research to date has been conducted to determine whether promoting social engagement could be an effective intervention to reduce the risk of poor cognitive health among older Latinos. In addition, it is important to explore whether the strength of the relationship between greater social engagement and better cognitive health outcomes among older Latinos with Mexican heritage varies by gender, as a study of

a predominantly non-Hispanic White sample found stronger associations between social engagement activities and cognitive health for women than for men (Wen et al., 2025).

The objective of the current study was to examine the nature of the associations between social relationship variables and cognitive function in older Mexican heritage Latinos in the U.S, who are at heightened risk of dementia. The current study also aimed to investigate whether social engagement would predict cognitive function beyond perceived social support and social network size, which have been previously established as being strongly linked to cognitive health. We expected social engagement to be significantly associated with cognitive health and for social engagement to remain a significant predictor in the presence of perceived social support and social network characteristics.

Methods

Design, participants, and study setting

The present study utilized a cross-sectional research design. Participants were 163 Mexican heritage Latinos aged 55 to 85 years ($M = 67.9$, $SD = 7.0$) recruited from the Rio Grande Valley (RGV) of Texas, which comprises four counties along the southernmost tip of Texas, bordering Mexico. Ninety-eight percent of the residents in the RGV are Latino, and 95% of those have Mexican heritage (U.S. Census Bureau, 2023).

Individuals were recruited utilizing printed study flyers posted in public areas such as libraries, medical clinics, and adult daycare centers. Although the sample was not randomly selected, participants came from a variety of educational and socioeconomic backgrounds representative of the wider RGV community. Inclusion criteria for the study were age 55 or older and having Mexican heritage. Participants with conditions that could interfere with their performance on the cognitive health measure were excluded from participating; these included a history of ADRD; major psychiatric disorders such as schizophrenia, bipolar disorder, or major depressive disorder; traumatic brain injury; developmental disabilities; and a history of, or active alcohol/substance abuse disorders. Participants were asked to self-report the presence of any of the excluded conditions.

Participants were administered in-person interviews in their preferred language, either English or Spanish, from April to August 2023, by trained research assistants certified to administer the cognitive screening measure, the Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005). Research assistants administered all measures, including those designed to be self-administered. Written informed consent was obtained prior to starting the survey interview. Participants were given \$50 gift cards to their choice of Wal-Mart or a local grocery store upon completion of the interview as an incentive for participating in the study. All study procedures were approved by the Institutional Review Board of the University of Texas Rio Grande Valley (Exempt determination for IRB 22-0258).

Measures

Dependent variable

General cognitive function was assessed using the MoCA, a screening tool for mild cognitive impairment, which evaluates memory, visuospatial ability, executive function, attention, language, and orientation to time and place (Nasreddine et al., 2005). Its validity has been established with community samples (Luis et al., 2009). The MoCA has been translated into Spanish and validated for use with Spanish-speaking individuals (Aguilar-Navarro et al., 2018). Scores on the MoCA can range from 0 to 30, with lower scores indicating cognitive impairment. The conventional cutoff score for normal cognition on the MoCA is 26 or higher; however, the recommended cutoff score for normal cognition when interpreting the MoCA for Hispanic/Latinos is 24 (Milani et al., 2018).

Predictors

Social engagement was assessed with the Social Engagement and Activities (SEAQ), an instrument initially developed to measure social engagement in low-income, homebound older adults with depression over the age of 50 (Marti & Choi, 2022). The SEAQ asks participants how often they engage in ten different social activities, including attending religious services, going outside the home for non-medical purposes, socializing with family and friends, participating in recreational activities, and

engaging in group exercises or organized meetings. It does not include social network characteristics. The SEAQ measures the aforementioned social engagement activities over the past month, with responses on a scale ranging from 0 to 5 (0 = not at all, 1 = just one time, 2 = 2–3 times, 3 = once a week, 4 = more than once a week, and 5 = every day). Scores on the SEAQ range from 0 to 50, with higher scores indicating higher levels of social engagement. The SEAQ was translated into Spanish for the current study using standard forward and back-translation procedures. The Cronbach's alpha for the full sample, for participants who completed the interview in Spanish, and for participants who completed the interview in English were .60, .47, and .66, respectively.

Part 2 of the Personal Resource Questionnaire (PRQ) was used to measure perceived social support (Brandt & Weinert, 1981). Part 2 of the PRQ consists of 25 items, including questions such as “*There is someone I feel close to who makes me feel secure*” and “*I know that others appreciate me as a person.*” The measure utilizes a Likert scale with responses ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). A validated, existing Spanish translation was utilized for this study (Hovey, 2000). Scores on this measure range from 25 to 175, with higher scores indicating higher levels of perceived social support. The Cronbach's alpha for the full sample, for participants who completed the interview in Spanish, and for participants who completed the interview in English were .90, .85, and .91, respectively.

An abbreviated version of the Lubben Social Network Scale (LSNS-6) was used to assess social network size and levels of interaction with family and friends (Lubben et al., 2006). The scale consists of 6 questions that assess ties to family and friends, including the following question repeated for friends: “How many relatives do you see or hear from at least once a month?” “How many relatives do you feel close to such that you could call on them for help?” “How many relatives do you feel at ease with that you can talk about private matters?” Response options range from 0 (none) to 5 (nine or more relatives or friends). Scores range from 0 to 30, with higher scores indicating more social ties. An established, validated Spanish translation was utilized for the study (Vilar-Compote et al., 2018). The Cronbach's alpha for the full sample, for

participants who completed the interview in Spanish, and for participants who completed the interview in English were .77, .75, and .81, respectively.

Covariates

The following factors previously found to influence cognitive function were entered as covariates in the regression analysis: age, educational attainment (assessed using a 5-point scale entered as a continuous variable, 1 = elementary school or less, 2 = more than elementary school up to 11th grade, 3 = high school degree, 4 = some college to bachelor's degree, 5 = graduate degree or professional degree), and depressive symptom score (continuous). Depressive symptoms, which increase the risk of dementia in early, mid-, and late-life (Elser et al., 2023), were assessed with the Patient Health Questionnaire 9 (PHQ-9) – a 9-item checklist of depression symptoms designed to be self-administered (Kroenke et al., 2001). Responses to each item are scored from 0 (not at all) to 3 (nearly every day), with a total score ranging from 0 to 27, with higher scores indicating greater symptom severity. Scores greater than 20 indicate severe depression. An established, validated Spanish translation was utilized for those interviewed in Spanish (Martinez et al., 2023). The Cronbach's alphas for the full sample, for participants who completed the Spanish version of the PHQ-9, and for participants who completed the original English version were .88, .87, and .89, respectively.

The presence of T2DM (no T2DM = 0, T2DM positive = 1) and cardiovascular disease (no heart disease and/or stroke = 0, presence of heart disease and/or stroke = 1), also ascertained during the interview, were entered as covariates.

Data analysis

The minimum sample size needed to test the study hypothesis was determined based on an a priori power analysis conducted with G*Power version 3.1.9.6 (Faul et al., 2009), which indicated that a minimum sample size of 114 was needed to achieve 80% power to detect a medium effect at $\alpha = .05$ for a multiple regression analysis with nine predictors. Therefore, the study is sufficiently powered based on a sample size of $N=163$.

We conducted all analyses with SPSS 28 (IBM Corp [IBM], 2021). Means, standard deviations, and frequencies were calculated to describe the sample. Chi-square tests of independence for categorical variables and independent-samples *t*-tests were conducted to examine whether there were statistically significant differences between men and women on the predictor, covariate, and outcome variables. Pearson's correlations with pairwise deletion for missing values were computed between the main continuous variables of interest. A hierarchical multiple regression analysis was conducted with cognitive health as the criterion variable and social engagement as the final predictor after social network and perceived social support, controlling for demographics, medical conditions, and depressive symptoms. Listwise deletion was used in the regression analysis to handle missing values.

Results

Sample characteristics are reported in Table 1. The study sample had a mean age of 67.9 (*SD*: 6.97) with a higher proportion of females than males (68.7% and 31.3%, respectively). More than half of the participants (51.5%) were born in Mexico, and 57.1% chose to be tested in Spanish. Sixty-two percent of the sample had less than a high school diploma, and 83.9% reported an annual household income of less than \$50,000 a year.

A total of 63.2% of the total sample had scores on the MoCA indicative of mild cognitive impairment or

dementia, based on recommendations for interpreting the test with Hispanics/Latinos (Milani et al., 2018).

Levels of social engagement for our sample ($M=17.89$, $SD=6.7$) were considerably higher than those reported by Marti and Choi (2022) in their community-based study of homebound adults ($M=12.2$, $SD=6.1$), the only normative data available for the instrument.

Differences by gender were examined for the predictor, covariate, and outcome variables. The only statistically significant difference between men and women was age; women were significantly younger ($M=67.2$, $SD=6.9$) than men ($M=69.3$, $SD=7.0$). The results of these analyses are reported in Table 1.

Results of the correlation analysis are reported in Table 2 and show that the cognitive function score was significantly positively associated with perceived social support, social network (p 's < .01), and social engagement ($p < .001$).

Results of a hierarchical regression analysis are presented in Table 3.

We included all covariates in Step 1. These factors explained 35.0% of the variance in cognitive function ($p < .001$). In Step 2, social network and perceived social support were entered. Neither factor was a significant predictor of cognitive function. Next, social engagement was entered in Step 3 (the complete model). It was identified as a unique and significant predictor of cognitive function ($p = .001$) and explained an additional 4.1% of the variance ($p < .001$). The full model explained 40.2% of the variance in cognitive function scores ($p < .001$). In

Table 1. Sample characteristics, group differences, and *p*-value for tests of significance by gender.

Characteristic	Total Sample <i>N</i> =163	Women <i>N</i> =112	Men <i>N</i> =51	<i>p</i> -value
Age (years), <i>M</i> (<i>SD</i>)	67.87 (6.97)	67.24 (6.91)	69.25 (6.96)	.049
Education				
Elementary school or less	4.3%	4.5%	3.9%	.874
More than elementary, less than 11th grade	39.9%	38.4%	43.1%	.566
High school graduate or GED	19.0%	22.3%	11.8%	.111
Some college to bachelor's degree	31.9%	30.4%	35.3%	.531
Graduate or professional degree	4.9%	4.5%	5.9%	.698
Annual household income				
≤\$20,000	57.4%	58.9%	45.1%	.225
\$20,001 to \$49,999	26.5%	25.0%	25.5%	.740
≥\$50,000	16.1%	13.8%	21.7%	.217
Depression	6.25 (6.01)	6.79 (6.42)	5.08 (4.85)	.076
Diabetes	49.1%	50.9%	45.1%	.303
CVD	23.3%	22.3%	25.5%	.692
MoCA (Cognitive Function), <i>M</i> (<i>SD</i>)	21.55 (4.41)	21.95 (4.37)	20.67 (4.40)	.086
MoCA score				
< 24, MCI or dementia	63.2%	58.9%	72.5%	.095
Social Network	21.08 (5.36)	21.44 (5.11)	20.31 (5.87)	.216
Perceived Social Support	136.46 (19.33)	138.04 (19.10)	133.06 (19.56)	.129
Social Engagement Activities Questionnaire	17.89 (6.72)	17.98 (6.72)	17.69 (6.92)	.795

Table 2. Correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Age (<i>N</i> = 163)	–	–	–	–	–	–	–	–	–
2. Gender (<i>N</i> = 163)	–.13	–	–	–	–	–	–	–	–
3. Education (<i>N</i> = 163)	–.27***	–.05	–	–	–	–	–	–	–
4. T2DM (<i>N</i> = 163)	.02	.05	–.10	–	–	–	–	–	–
5. CVD (<i>N</i> = 163)	.06	–.04	–.08	.14	–	–	–	–	–
6. Depressive Symptoms (<i>N</i> = 162)	.03	.13	–.21**	.05	.10	–	–	–	–
7. Social Network (<i>N</i> = 163)	–.01	.10	.22**	–.20**	–.15	–.17*	–	–	–
8. Perceived Social Support (<i>N</i> = 161)	–.01	.12	.23**	–.04	–.23**	–.37***	.37***	–	–
9. Social Engagement (<i>N</i> = 163)	–.10	.02	.35***	–.19*	–.05	–.25**	.39***	.35***	–
10. Cognitive Function (<i>N</i> = 163)	–.38 ***	.14	.48***	–.22**	–.15	–.24**	.23**	.22**	.43***

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3. Results of hierarchical regression analysis.

	Model 1 (+Depression)			Model 2 (+Social Network and Social Support)			Model 3 (+Social Engagement)		
	Unstandardized <i>B</i>	Standardized β	<i>p</i>	Unstandardized <i>B</i>	Standardized β	<i>p</i>	Unstandardized <i>B</i>	Standardized β	<i>p</i>
Age	–.167	–.261	<.001	–.172	–.269	<.001	–.168	–.261	<.001
Education	1.538	.363	<.001	1.442	.340	<.001	1.203	.284	<.001
T2DM	–1.445	–.164	<.001	–1.331	–.151	.025	–1.126	–.128	.051
CVD	–.152	–.014	.827	.075	.007	.915	–.138	–.013	.841
Depression	–.103	–.140	.037	–.080	–.109	.123	–.064	–.088	.203
Social Network				.064	.078	.279	–.013	–.016	.829
Social Support				.015	.064	.393	.005	.021	.773
Social Engagement							.157	.240	.001
<i>R</i> ²	.350			.350			.402		
<i>F</i>	16.688			12.358			12.790		
Sig. of model	<.001			<.001			<.001		
ΔR^2	.018			.011			.041		
<i>F</i> of ΔR^2	4.405			1.346			10.465		
Sig. of ΔR^2	.037			.263			.001		

addition to social engagement, the covariates of age and educational level remained significant ($p < .001$) while the presence of T2DM approached significance ($p = .051$).

An additional multiple regression analysis was conducted, excluding covariates, to examine the relative effects of the three social relationship factors (social network, perceived social support, and social engagement). In the abbreviated model, only social engagement was a significant predictor of the cognitive function score ($p < .001$); neither social network

($p = .55$) nor perceived social support ($p = .39$) were statistically significant predictors.

Separate regression models were also run for individuals who completed the interview in Spanish and those who completed it in English to determine whether there were any differences in the patterns of results between the two groups. These results are reported in Table 4. Among the three social relationship variables, only social engagement was found to be a significant predictor of cognitive function in both models.

Table 4. Results of full regression analysis for participants who chose Spanish interview compared to English interview.

	Model 3 Spanish			Model 3 English		
	Unstandardized <i>B</i>	Standardized β	<i>p</i>	Unstandardized <i>B</i>	Standardized β	<i>p</i>
Age	–.213	–.344	<.001	–.119	–.198	.081
Education	.775	.174	.095	1.430	.345	.003
T2DM	–1.625	–.174	.065	–.767	–.107	.305
CVD	–.327	–.027	.779	–.816	–.106	.315
Depression	–.050	–.067	.476	–.049	–.077	.524
Social Network	–.070	–.081	.454	.119	.180	.130
Social Support	.018	.069	.491	–.010	–.057	.653
Social Engagement	.168	.217	.050	.131	.270	.023
<i>R</i> ²	.366			.434		
<i>F</i>	6.049			5.661		
Sig. of model	<.001			<.001		

Discussion

The current study examined the relative strength of three social relationship variables – social network, perceived social support, and social engagement – in predicting cognitive health among older Mexican heritage Latinos, controlling for well-established covariates, including demographics, medical conditions, and depression. As expected, higher levels of social engagement uniquely and significantly predicted cognitive function beyond the effects of perceived social support and social network characteristics, both of which have been identified as robust predictors of cognitive health in previous research (e.g., Estrella et al., 2024; Holtzman et al., 2004).

The current finding that the three social relationship variables are significantly correlated with one another is consistent with social network theory, which posits that social engagement, perceived social support, and social network characteristics are interconnected facets of social relationships (Berkman et al., 2000). According to the theory (Berkman et al., 2000), the characteristics of an individual's social networks – such as size, density, and proximity – form the foundation of social relationships that enable both perceived social support and social engagement. As a result, individuals with high levels of one facet of social relationships are likely to have high levels of the other facets, explaining the strong associations observed among these constructs in the current study.

The full regression model revealed that social engagement was the strongest predictor of cognitive health. In contrast, social network characteristics were not significant when modeled with social engagement, perceived social support, and covariates. Neither social networks nor perceived social support contributed to cognitive health beyond the effects of the covariates (Step 2), underscoring the importance of demographic, medical, and psychological factors in cognitive health among older Latinos of Mexican Heritage. Notably, although the social relationship variables were significantly correlated with one another and the increase in explained variance (ΔR^2) associated with social engagement was small (4%), this pattern suggests that social engagement may represent a more proximal and salient aspect of cognitive health than

social support or social network. This interpretation aligns with social network theory (Berkman et al., 2000), which conceptualizes social networks as more distal influences on health, while social engagement and perceived social support operate as more immediate mechanisms. Thus, social engagement likely makes a meaningful contribution to cognitive health, whereas social networks may exert a relatively weak or indirect influence. Although previous research, including our correlation results, has shown direct associations between social networks and cognitive health in older adulthood (Perry et al., 2021), these relationships are likely mediated or attenuated by more proximal factors such as perceived social support and social engagement.

Perceived social support, another proximal factor to cognitive health according to social network theory (Berkman, et al., 2000), was not a unique predictor of cognitive function in this study, when compared to social engagement. It is believed that perceived social support contributes to cognitive health outcomes primarily by mitigating the adverse effects of stress (Ozbay et al., 2007). The effects of perceived social support on cognitive health may be most pronounced when external stressors are taken explicitly into account.

Our results highlight the critical role of social engagement in fostering cognitive health in older adulthood. Consistent with Social Network Theory (Berkman et al., 2000) and recent evidence showing that social engagement mediates the association between social networks and longitudinal change in executive function (Ihle et al., 2021), these findings suggest that social engagement is a key mechanism protecting against age-related cognitive decline. Unlike social networks, which reflect the structural aspects of relationships, or social support, which reflects perceived availability of assistance, social engagement captures the active participation in social activities that stimulates cognitive and neural processes. From the perspective of the Scaffolding Theory of Aging and Cognition (Reuter-Lorenz & Park, 2014), social engagement can be conceptualized as a form of neural enrichment that operates through two complementary pathways. The first involves direct neural enrichment, which contributes to the maintenance of brain structure and function through improved

network efficiency, greater cortical thickness, higher synaptic density, and other markers of brain health. The second is an indirect pathway through which life course enrichment factors such as social engagement strengthen adaptive neural processes that support compensatory scaffolding, thereby enhancing the brain's capacity to recruit alternative networks and sustain cognitive performance in the face of age-related neural decline.

The current findings suggest that social engagement interventions could be effective in reducing the risk of ADRD and its associated consequences among older Mexican heritage Latinos, a group at elevated risk. A recent study concluded that Mexican heritage Medicare beneficiaries aged 65 and older were more likely than non-Latino White beneficiaries to experience cognitive impairment, functional limitations, and health comorbidities (Downer et al., 2020). This study also reported the link between ADRD complications and increased hospitalization and emergency room admissions in this population. Community-based efforts to increase social engagement may lower the prevalence of ADRD and improve overall health and well-being among older individuals of Mexican heritage.

The observed association between social engagement and cognitive function among older Mexican heritage adults is consistent with prior research underscoring the importance of culturally embedded social relationships for Latino well-being. While social engagement among Latinos often centers on family-based interactions, broader opportunities for community, religious, and volunteer participation may be constrained by socioeconomic and structural factors. These findings suggest that engagement beyond the family network may serve as an important mechanism for maintaining cognitive health in later life. Interventions designed to foster culturally relevant and accessible forms of social engagement could therefore play a vital role in supporting cognitive resilience among older Latinos.

Social engagement interventions aimed at reducing ADRD risk among Mexican heritage older adults could prioritize individuals with elevated risk factors such as Type 2 diabetes and cardiovascular disease. Given the high prevalence of these

conditions among Mexican heritage adults in South Texas border communities, interventions should be designed to align with participants' health needs. Incorporating activities that foster social connection while promoting physical well-being – such as group exercise, walking clubs, or healthy-cooking sessions – may enhance social engagement while addressing key modifiable risk factors for ADRD. Evidence from the Happy Older Latinos are Active (HOLA) pilot randomized clinical trial – a culturally tailored, multicomponent health promotion program designed to prevent depression and anxiety in older Latinos (Jimenez et al., 2025) – demonstrates that culturally grounded programs can simultaneously improve physical, cognitive, and mental health while reducing stigma and barriers to care. Building on this model, social engagement interventions that integrate culturally meaningful activities may offer a comprehensive approach to promoting well-being among Mexican heritage older adults.

Another way to enhance the cultural relevance and effectiveness of social engagement programs is to have Community Health Workers (CHWs), such as promotoras, lead these initiatives. Because they have strong community ties and share similar ethnic, socioeconomic, and experiential backgrounds with participants, CHWs are particularly well positioned to facilitate such efforts. Findings from the HOLA intervention further indicate that CHW-led programs can achieve high participant satisfaction and significant reductions in anxiety symptoms compared with control conditions (Jimenez et al., 2025). Extending this approach to social engagement interventions may strengthen cultural fit, trust, and sustained participation while addressing interconnected cognitive, physical, and mental health disparities among older Mexican heritage adults.

Community-engaged adaptation processes are also critical when designing social engagement interventions for individuals affected by or at risk for ADRD. An illustrative example is *De Pie y a Movernos*, a remote physical activity program for middle-aged and older Hispanic adults developed to increase physical activity and reduce dementia risk (Zlatar et al., 2025). The program incorporated input from a community advisory board and employed bilingual staff to ensure cultural and

linguistic appropriateness. Although primarily focused on physical activity, it also included components of social interaction and support – key mechanisms through which engagement-based approaches may promote cognitive health. The pilot demonstrated high feasibility and acceptability, achieving a 100% completion rate in its three-week implementation (Zlatar et al., 2025). These principles may similarly inform the design of culturally responsive social engagement interventions aimed at reducing dementia risk among Latino populations.

Lastly, social engagement interventions should be responsive to participants' sociodemographic contexts. Although the current sample reported relatively high levels of social engagement, prior research links lower socioeconomic status and education to reduced engagement among individuals with mild cognitive impairment (Amano et al., 2019). For older Latinos in economically disadvantaged border communities, this highlights the need for additional supports, such as transportation assistance, to facilitate participation (Zhu et al., 2023).

Future research should examine whether the effectiveness of social engagement interventions for older Latinos varies according to acculturation-related factors such as familism, cultural identity, and endorsement of traditional versus modern cultural values, in order to enhance the cultural relevance and acceptability of these programs. Incorporating neuroimaging methods could also help clarify the neural mechanisms through which social engagement supports cognitive health among Mexican heritage individuals, who are at increased risk for vascular dementia relative to Alzheimer's disease. Finally, given the high prevalence of anxiety in older adults and its established association with poorer cognitive outcomes (Byers et al., 2010; Gulpers et al., 2016), future studies should assess the role of anxiety in shaping the relationship between social engagement and cognitive function among older Latinos.

Limitations

The current findings should be interpreted in light of several study limitations. First, although focusing exclusively on Mexican heritage Latinos, an understudied cultural group, is a strength, the findings may not generalize to other Latino subgroups or

ethnic minority populations. Participants were drawn from a region along the Texas – Mexico border characterized by low socioeconomic status, low educational attainment, and a predominantly Latino population (approximately 90%). These regional characteristics may limit generalizability to Mexican Americans residing in other areas of the United States with different demographic or cultural contexts.

The Social Engagement and Activity Questionnaire (SEAQ) demonstrated low internal consistency reliability, particularly among Spanish-speaking participants. Examination of response patterns indicated that the lower reliability reflected fewer endorsements of activities such as attending enrichment programs, engaging in political activities, and informal volunteering among Spanish speakers relative to English speakers. Conversely, a higher proportion of Spanish-speaking participants reported attending group activities, suggesting greater participation in religious organizations and stronger church involvement. This pattern underscores the need for social engagement measures that more accurately capture the culturally specific engagement patterns of Spanish-speaking Latinos of Mexican heritage.

Finally, the cross-sectional design limits causal inference regarding the directionality of the relationship between social engagement and cognitive function. Nonetheless, the current findings provide an important foundation for future longitudinal research on the role of social engagement in cognitive aging among Mexican heritage Latinos.

Clinical implications

The present findings offer actionable guidance for clinicians, community practitioners, and health professionals working with older Mexican heritage adults and other underserved populations:

- Although traditional clinical risk factors like diabetes and depression remain important, practitioners should also assess levels of social engagement during cognitive health evaluations, particularly in underserved, ethnically diverse populations. Tools such as the Social Engagement and Activities Questionnaire could be valuable for identifying patients at risk of social disengagement and cognitive vulnerability.

- Given the elevated prevalence of ADRD and related risk factors in older Mexican heritage Latinos, culturally tailored community-based programs that facilitate participation in religious services, group activities, recreational programs, and intergenerational initiatives may serve as effective, low-cost approaches to strengthen cognitive reserve.
- Interdisciplinary teams comprising social workers, psychologists, and geriatricians can improve care outcomes by incorporating structured social engagement components into individual care plans. Community health workers may also play an essential role in outreach and engagement.

Acknowledgments

The authors gratefully acknowledge the research assistants whose efforts in data collection were instrumental to the success of this project. We are especially indebted to the participants, whose time, insights, and willingness to share their experiences made this research possible.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The research reported here was supported by the National Institute on Aging grant [P30 AG059305]. The content is solely the responsibility of the authors and does not necessarily represent the views of the National Institute on Aging/ National Institutes of Health.

Data availability statement

The participants in this study did not provide written consent for their data to be shared publicly; therefore, due to the sensitive nature of the research, supporting data is not available.

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