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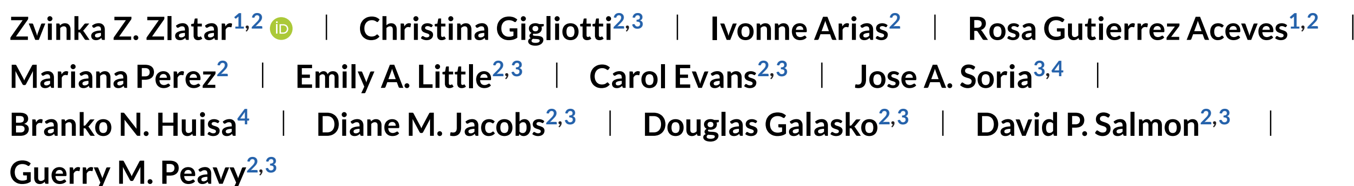
RESEARCH ARTICLE

Promotores program to increase Hispanic/Latino(a) participation in Alzheimer's disease research



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Abstract

INTRODUCTION: Hispanic/Latino(a/x) (H/L) representation in Alzheimer's disease and related dementias (ADRD) research remains low, limiting generalizability of findings and interventions to this growing population. H/L community health workers ("Promotores") can enhance awareness of brain health and help guide their communities toward ADRD research opportunities; however, the effectiveness of recruitment through Promotores compared to traditional clinic-based approaches remains unknown. This study evaluates our Promotores training and compares the two approaches on recruitment success and characteristics of those recruited into a longitudinal study of ADRD.

METHODS: Nine Promotores completed Building Research Integrity and Capacity (BRIC) training on research concepts and ethics, and video training modules on ADRD-related research procedures. Training effectiveness was evaluated via pre-/post-tests to evaluate content knowledge and program satisfaction was evaluated by a self-report survey. Recruitment success was compared between Promotores-based and clinic-based approaches, assessing numbers referred and enrolled in ADRD research, and participants' demographic and clinical characteristics and agreement to specific research procedures (i.e., lumbar puncture, brain donation).

RESULTS: Promotores showed significant gains in knowledge of research concepts (Wilcoxon test, $p = 0.005$; median increase = 52%, 95% confidence interval [CI] = 30%–70%) and ADRD content ($p = 0.042$; median increase = 10%, 95% CI = 5%–40%). Promotores strongly agreed (on a 5-point Likert scale) that their training improved understanding of researcher responsibilities ($\bar{x} = 4.88 \pm 0.35$), participant rights ($\bar{x} = 4.25 \pm 1.49$), and ADRD research procedures ($\bar{x} = 3.88 \pm 1.36$). Satisfaction with training materials ($\bar{x} = 4.63 \pm 0.74$) and perceived community benefit ($\bar{x} = 4.75 \pm 0.46$) were high. Promotores and clinic pathways had similar enrollment proportions (12.6% vs.

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16.5%; $X^2 = 0.92$, $p = 0.34$) and participants were comparable across demographic, clinical, social determinants of health, and willingness to undergo research procedures.
DISCUSSION: The Promotores training program was well received, improved research literacy, and was as successful as clinic-based recruitment in enrolling older H/L adults into ADRD research. Results validate our Promotores training strategy and support a multipronged community-oriented approach to H/L participation in ADRD research.

KEYWORDS
community-engaged research, community health workers, dementia, diversity, outreach, Promotoras, recruitment science

Highlights

- Promotores training improved research literacy and Alzheimer's disease and related dementias (ADRD) knowledge.
- Promotores reported high satisfaction and perceived community benefit.
- Trained Promotores recruitment matched clinic-based enrollment outcomes.
- Participant's characteristics were comparable across recruitment pathways.
- The Promotores model can boost Hispanic/Latino(a) participation in ADRD research.

1 | INTRODUCTION

Although ≈ 10% of individuals with Alzheimer's disease (AD) and related dementias (ADRD) in the United States self-identify as Hispanic/Latino(a/x; H/L),[1–3] H/L represent < 4% of ADRD research participants, limiting generalizability and worsening health inequities.[4–6] Efforts to increase H/L participation have led to community-based recruitment strategies grounded in participatory research principles emphasizing precision recruitment;[7] use of existing community strengths; and long-term, reciprocal relationships that address barriers and ensure community and scientific benefit. Approaches include culturally and linguistically tailored educational materials,[8] establishing research facilities within communities to increase access,[9] partnering with trusted physicians,[10,11] and collaborating with community organizations and community health workers (CHWs) to increase ADRD awareness and guide research engagement.[10]

Several studies have shown the value of H/L CHWs (Promotores) in providing culturally relevant ADRD education and advocacy within H/L communities.[10,12–14] As trusted peers who share language and culture, Promotores are well positioned to explain the importance of ADRD research, the need for H/L representation, and reinforce participation. They can also facilitate recruitment by conducting cognitive screening[13,15] and serving as liaisons between potential participants and researchers.[10] These roles require training in ADRD fundamentals (e.g., definition, risk factors, symptoms, stigma, management), familiarity with research procedures (e.g., cognitive testing, magnetic resonances imaging [MRI], positron emission tomography [PET], lumbar puncture [LP], brain donation), understanding research ethics,[16] and application of CHW competencies to[17] dementia research.[18,19] This specialized knowledge is important because Promotores need to accurately explain to community members the importance of participating in research, the kinds of procedures they would be expected to complete (e.g., MRI, LP, brain donation) and why they are important to ADRD research. Moreover, knowledge of basic research methodology (e.g., interventions vs. observational and longitudinal studies) and research ethics (e.g., how a participant's information is kept confidential and is separate from their medical record) is paramount so that Promotores can explain these concepts to potential participants and reduce worries about participation in ADRD research. Applying this community-based approach, we developed a Promotores program at the University of California San Diego (UCSD) Shiley-Marcos Alzheimer's Disease Research Center (ADRC) to increase recruitment of H/L older adults into ADRD research. Promotores received specialized training in research methods and ethics and ADRD research procedures, and participated in monthly meetings with ADRC staff to stay informed on referral processes, research updates, and recruitment goals.

Another community-based approach for H/L recruitment into ADRD research is partnering with geriatric primary care or neurology clinics in H/L communities.[10] Building on our previously described clinic-based program,[20] we developed a bilingual cognitive screening program in which a psychometrist performs brief cognitive testing in the clinic with patients the health care provider suspects are cognitively impaired.[21] Results are reviewed by neuropsychologists and behavioral neurologists with expertise in ADRD and findings are returned to the referring health-care provider. During the screening session, patients are briefly introduced to ADRD research and asked for permission to be contacted about participation.

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While H/L participation in ADRD research can be enhanced through Promotores[10] and clinic-based cognitive screening programs,[21] the relative success of these two approaches, and the characteristics of participants they engage, have not been directly compared. Differences in the base populations served (i.e., patients seeking medical help vs. community members with or without cognitive symptoms) could lead to differences in age, education, social determinants of health, probability of dementia or mild cognitive impairment (MCI), or likelihood of agreeing to various research procedures. The present study evaluated the ADRC Promotores program in terms of achievement of education goals and success in recruitment of H/L participants into a longitudinal observational ADRD study, and compared the characteristics of those successfully enrolled through the Promotores to those enrolled through clinic-based cognitive screening.

RESEARCH IN CONTEXT

1. **Systematic Review**: The authors reviewed the literature using PubMed on Hispanic/Latino (H/L) participation in Alzheimer's disease and related dementias (ADRD) research, community-engaged recruitment, and Promotores/community health worker models in ADRD research. Although Promotores are highly valued in community-engaged research, studies about their role in ADRD research recruitment compared to more traditional recruitment methods is lacking.
2. **Interpretation**: Findings show that trained H/L Promotores can achieve recruitment success comparable to traditional clinic-based strategies while significantly improving their research literacy and maintaining high satisfaction, supporting the feasibility and acceptability of community-based recruitment pathways for H/L populations in ADRD research.
3. **Future Directions**: Future studies should assess how Promotores can support community memory screening efforts for targeted recruitment strategies, increase reach and scalability, and enhance participant retention in longitudinal ADRD studies.

2 | METHODS

2.1 | Participants

Promotores were recruited into our program through ADRC-affiliated staff who were involved with local Promotores organizations or community outreach and engagement efforts. One of these staff members later served as liaison between the ADRC research team and the Promotores. Most of the Promotores were affiliated with various San Diego health-related non-profit organizations serving H/L communities (e.g., Visión y Compromiso, Clínica La Maestra, San Diego Coalition of Promotoras); however, their participation in our program was independent from any other community organization. Potential Promotores were individually invited on a voluntary basis in exchange for formal education about ADRD and ADRD clinical research that would help formalize their status as research Promotores in this area. All of those interested in serving were accepted into the program without further screening or selection, but had, on average, > 10 years of experience working with the community through various programs. Several continued to support other initiatives in addition to this project. Twelve volunteers initially joined and 10 completed training, although 1 dropped out after completing training. Nine Promotores remained in the program and were certified as UCSD volunteer staff. All nine were women and averaged 66.9 years of age (standard deviation [SD] = 10.3, range = 42–79) and 13.2 years of formal education (SD = 2.3, range = 8–16). All identified as H/L (all from Mexico, except one from the Dominican Republic) and were monolingual Spanish or bilingual Spanish–English (Spanish dominant) speakers. Two of them held other jobs while the rest were retired. Informed consent was not required from the Promotores for this program evaluation project.

2.2 | Procedure

2.2.1 | Promotores ADRC training program

Formal training was carried out over four training sessions at computer stations in a public library with the assistance of a UCSD study staff coordinator who served as a liaison between the Promotores and the ADRC research team. In total, Promotores completed 4 hours and 15 minutes of structured training about basic research concepts and ethics, clinical features of ADRD, and various research procedures used in the ADRC longitudinal observational ADRD study (e.g., brain MRI, LP, brain donation). The Building Research Integrity and Capacity (BRIC) program[22,23] covered research concepts and ethics. Clinical features of ADRD and research procedures were covered in video modules recorded by bilingual Spanish-speaking faculty of the UCSD ADRC. These components of training are described in detail below.

The BRIC program[23] is a 2.5-hour online education course designed specifically for CHWs and Promotores to teach fundamental elements of scientific research (e.g., study design, random assignment, reliability, bias) and research ethics and standards (e.g., privacy, informed consent, data confidentiality). Training materials are presented in eight video modules in English or Spanish. The BRIC program is free online but with a cost of $40 for a certificate of completion (paid by the ADRC). Learning is assessed with a 24-question multiple-choice test covering course materials and research-related vignettes. We administered the test before (BRIC pre-test) and after (BRIC post-test) training to measure knowledge gained.

A series of five training videos featuring Spanish-speaking ADRC faculty were recorded to provide key information about the clinical and neuropsychological features of ADRD; the design of the ADRC longitudinal study and various research methods used; and the "why", "how," and importance of MRI, LP, and brain donation in ADRD research. The videos lasted ≈ 1 hour and 45 minutes. Training videos are available

at https://www.youtube.com/@UCSDShileyMarcosADRC/videos. Promotores viewed the videos as a group with the program coordinator. A 20-question multiple-choice test covering information provided in the videos was administered both before (ADRC video pre-test) and after (ADRC video post-test) to measure knowledge gained.

After training and certification, Promotores attended monthly 1-hour meetings with ADRC faculty, community partners, and physicians to maintain engagement and communication. These sessions were organized and led by the ADRC liaison. The monthly meetings provided continuing education on ADRD-related topics (e.g., newest treatments, AD variants, dementia with Lewy bodies), updates on recruitment initiatives and logistics (i.e., upcoming community events and which Promotores would attend), and opportunities to discuss challenges (i.e., why are potential participants not interested in the study? What are the barriers?) and monitor recruitment success (i.e., which venues or events are yielding more referrals, provide incentives for successful recruitments). All Promotores brought lists of upcoming community events they wanted to attend. There was no specific recruitment expectation from the Promotores, but they were encouraged to engage individuals in the community, promote research participation, and refer interested people to the ADRC. When someone was interested and agreed to be referred, the Promotores sent their contact information to the ADRC liaison. The liaison then contacted the potential participant to ask a few basic eligibility questions. Those interested in participating in the longitudinal study were triaged to the ADRC coordinator who then scheduled them for a full screening session.

After 24 months of community outreach and recruitment, the Promotores completed a 22-item survey to determine their satisfaction with the training program and perceptions of the resources and community engagement efforts, focusing on how well the ADRC supported their understanding of research, confidence in outreach, adequacy of materials and resources, and the community's trust and participation in ADRD research. Survey questions were answered on a five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree).

Certified ADRC Promotores received printed ADRD education materials (handouts, brochures) and guidelines on study inclusion criteria and recruitment goals, reviewed regularly during monthly meetings. They were trained to refer potential participants to ADRC staff via the liaison for medical screening and enrollment. Promotores engaged their communities through education, discussions, and outreach at a wide variety of events such as health fairs and education events at senior centers and other non-profit organizations throughout the county, walks sponsored by the Alzheimer's Association or Alzheimer's San Diego, memory screening events at neighborhood churches and medical clinics (they did not administer cognitive screening but were present for recruitment efforts at ADRC memory screening events), and brain health presentations at the health information desk of the Mexican consulate in San Diego. Outreach events were posted on the ADRC community education calendar and tracked by attending ADRC staff or the liaison who completed a brief web-based link (via phone or tablet/computer) that recorded the name and location of the event, the event sponsor/partner, language of the event, and estimated number of attendees (including those from under-represented groups). When tabling events in the community, the Promotores were provided a tablecloth marked with the UCSD logo; National Institute on Aging–provided education materials about aging, dementia, and brain health to hand out to community members; flyers for the ADRC longitudinal study; and tabling giveaways such as ADRC-branded pens, bags, and t-shirts. When they identified eligible individuals, they collected contact information (name, age, and phone number) by paper and provided this information to the liaison for ADRC follow-up. Each Promotora received a $25 gift card for referrals resulting in successful enrollment.

2.2.2 | Clinic-based cognitive screening program

The Neuron Clinic, a neurology multi-specialist group focused on diagnosis and treatment of neurological disorders in a largely Mexican–American patient base, provided ADRC-sponsored assessments for patients aged 60+ with suspected cognitive decline. A bilingual psychometrist administered brief cognitive tests of memory, executive function, language, visuospatial ability, and attention, and brief questionnaires on medical history, medications, depression, and subjective cognitive decline. Results were reviewed within 2 weeks by ADRC specialists (neuropsychologist and behavioral neurologist) who classified cognition as normal, depression, MCI, or dementia. The procedures are described in detail elsewhere.[20] After screening, patients received an overview of ADRC research and were invited to consent for future contact. They were assured that their participation was entirely voluntary and unrelated to their clinical care. If they agreed with written informed consent, their demographic and contact information was given to the ADRC for additional screening. The Neuron Clinic received no compensation or incentive for successful referrals to the ADRC, but did benefit generally from having the results of the free brief cognitive assessment of their patients provided by our clinic-based screening program.

2.3 | ADRC cohort and research requirements

The primary goal of recruitment was to increase H/L participation in the UCSD ADRC longitudinal study, which tracks ADRD progression from preclinical stages to dementia. The ADRC goal is to maintain an active cohort of 500 individuals who are deeply phenotyped through annual assessments, with ≈ 20% to 25% of the cohort self-identifying as H/L consistent with the proportion of H/L ≥ 65 in San Diego County.[24] Given an estimated annual attrition rate of 10% per year, ≈ 60 to 70 new ADRC participants are recruited each year to meet cohort goals and replace those who die, drop from the study, or are otherwise lost to follow-up. Inclusion criteria include being age ≥ 60; ambulatory; proficient in English or Spanish; and having normal cognition, MCI, or dementia. Exclusion criteria are major stroke, current major psychiatric disorder, unstable major medical conditions (e.g., cardiac, pulmonary, or liver failure), or cancer within the last 2 years (other than squamous, basal, or prostate in situ). Participation in the ADRC longitudinal study requires annual standardized clinical (including blood

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draw), neurological, and neuropsychological evaluations[25] that take ≈ 6 hours per year. The evaluations require travel to ADRC facilities on the UCSD Medical School campus in La Jolla, California. A knowledgeable study partner must be available who can provide information about the participant's functional capacity. All participants, regardless of referral source, are asked to undergo an LP for analysis of cerebrospinal fluid (CSF) AD biomarkers, complete MRI or PET amyloid or tau brain imaging, and pre-consent to autopsy for brain donation. This discussion takes place during the informed consent process led by an ADRC study coordinator. To improve enrollment of H/L adults, agreement to these procedures has generally not been required, but is strongly encouraged. Participants who initially decline are re-asked about participating in these procedures at each yearly longitudinal appointment, after trust has been established with the study team and the research framework. Participants are compensated $50 for completing the annual ADRC evaluation and $100 for completing each procedure that requires an additional visit to the center (i.e., LP, MRI, PET).

2.3.1 | Measures of interest

To determine whether participants recruited via each method were similar, we compared those enrolled through each method on demographic characteristics, mental status scores (Mini-Mental State Examination,[26] Montreal Cognitive Assessment[27]), mental health scores (Geriatric Depression Scale[28]), and daily functioning (Functional Activity Questionnaire[29]), as well as basic medical information, perceived changes in cognitive ability (Subjective Cognitive Decline Questionnaire[30]), and ADRC diagnostic categorization. We also compared participants enrolled through each method on important social determinants of health measures known to affect cognition and dementia risk:[31] Psychological Acculturation Scale,[32] Short Acculturation Scale,[33] Health Access Questionnaire,[34] Area Deprivation Index,[35] and Perceived Stress Scale.[36] Enrollment was defined as providing written informed consent to participate in the ADRC longitudinal observational study and completing the baseline annual evaluation.

2.4 | Data analysis

Pre- and post-training test scores for the BRIC and ADRC video learning modules were compared using Wilcoxon related-samples sign rank tests (given the small sample). Median difference in pre-test and post-test percent correct, and 95% confidence intervals (CIs), were calculated. The frequency of successful enrollment into the ADRC longitudinal study via each pathway was compared using chi-squared tests and the 95% CI for the difference between proportions. Demographic and clinical characteristics of participants successfully enrolled via the two recruitment pathways were compared using independent-sample *t* tests with Cohen *d* effect sizes and the 95% CI for the true effect size, chi-squared tests and the 95% CI for the difference between proportions, or with Fisher exact tests and the 95% CI for the difference between proportions when the number of observations in one or more cells in the contingency table was less than five. The percentages of those enrolled from each recruitment pathway who agreed to and completed various ADRC research procedures were compared using Fisher exact tests and the 95% CI for the difference between proportions. Significance level was set at $p < 0.05$. Analyses were performed using SPSS version 29.0.2.0.

3 | RESULTS

3.1 | Promotores training

Ten Promotores completed BRIC and ADRC video training. One Promotora dropped from the program after completing all initial training leaving a total of nine to continue the program over time. Scores on the pre- and post-training evaluations for the BRIC ($n = 10$) and ADRC video learning ($n = 7$) programs are shown in Table 1. There was a significant increase in knowledge of research design, methods, and ethics after BRIC training (Wilcoxon related-samples sign rank test, $p = 0.005$; median increase = 52% correct, 95% CI = 30%–70%). Only seven of the Promotores completed both the pre- and post-tests for the ADRC video training modules (although all 10 viewed the videos and were considered to have completed the program) due to scheduling conflicts. Those seven demonstrated an increase in knowledge of ADRD and the nature and importance of specific AD-related research procedures used by the ADRC (Wilcoxon related-samples sign rank test, $p = 0.042$; median increase = 10% correct, 95% CI = 5%–40%).

After ≈ 24 months of working with the ADRC, eight of the nine Promotores who continued in the program after BRIC and video training completed the 22-item satisfaction survey during one of the monthly meetings (one was unavailable and did not complete the survey). Results are presented in Table 2. Overall, the training was reported to have strengthened Promotores' core competencies across research ethics, ADRD knowledge, and understanding of research procedures, while reinforcing the importance of diversity and equity in research participation. It also enhanced outreach and recruitment skills, supported trust building within the H/L community, and increased confidence in using ADRC resources to generate successful referrals and positive participant experiences.

3.2 | Research participants recruited via Promotores versus clinic approach

Figure 1 shows the flow of participants who expressed interest and agreed to be contacted about ADRD research opportunities through the Promotores and clinical-based cognitive screening programs. Each program identified 158 individuals for referral to the ADRC from ≈ 220 screened, and there was no significant difference between the two referral sources in the proportion of individuals successfully enrolled in the ADRC longitudinal study (Promotores: 12.6%, clinic based: 16.5%,

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TABLE 1 Pre- and post-training test scores achieved by Promotores on the Building Research Integrity and Capacity (BRIC) and the Alzheimer's Disease Research Center (ADRC) video training modules. The *p* values for Wilcoxon related-sample sign tests are shown.

	Pre-test mean or % (SD)	Post-test mean or % (SD)	*p* value
BRIC training ($n = 10$)			
Number correct (out of 24)	9.00 (6.27)	22.00 (1.05)	$p = 0.005$
Percent correct	36.0% (25.09)	88.0% (4.22)	
ADRC video training ($n = 7$)			
Number correct (out of 20)	14.33 (4.72)	19.14 (0.90)	$p = 0.042$
Percent correct	71.7% (23.59)	95.7% (4.50)	

Abbreviation: SD, standard deviation.

$X^2 = 0.92$; $p = 0.34$; 95% CI [−0.1156, 0.3968]). The 218 individuals who expressed interest in AD research through the Promotores program were drawn from an estimated total of > 1900 older adults who had attended one of 47 unique community events that the Promotores had covered during the study period. The 158 individuals referred to the ADRC represent an average of 17.5 referrals per Promotora (range = 1–59) over the 36 months of the study (November 2021 - December 2024). In general, Promotores who were older and more engaged with the program (i.e., attended > 80% of the monthly meetings) had higher referral rates.

Characteristics of participants successfully enrolled into the ADRC longitudinal study via each recruitment pathway are shown in Table 3. Most participants were from Mexico or were of Mexican ancestry (n = 42 Mexico, 2 Cuba, 2 Central America, 1 Puerto Rico). Groups did not differ significantly in age ($t[44] = -1.82$; $p = 0.076$; $d = -0.54$, 95% CI [−1.13, 0.057]), years of education ($t[42] = -0.58$; $p = 0.57$; $d = -0.177$, 95% CI [−0.778, 0.427]), or scores on the Mini-Mental State Examination[26] ($t[43] = 1.31$; $p = 0.197$, $d = 0.395$, 95% CI [−0.204, 0.990]), Montreal Cognitive Assessment[37] ($t[43] = 0.71$; $p = 0.485$; $d = 0.213$, 95% CI [−0.382, 0.805]), Geriatric Depression Scale[28] ($t[44] = 0.48$; $p = 0.636$; $d = 0.142$, 95% CI [−0.443, 0.725]), or Functional Activity Questionnaire[29] ($t[40] = -0.72$; $p = 0.474$; $d = -0.227$, 95% CI [−0.844, 0.392]). Groups also did not differ significantly in the proportion of females (Fisher exact test, $p = 0.13$; 95% CI [−0.4815, 0.0354]), those tested in Spanish (Fisher exact test, $p = 0.18$; 95% CI [−0.208, 1.006]), or those reporting a past head injury (Fisher exact test; $p = 1.00$; 95% CI [−0.2550, 0.2037]) or stroke/transient ischemic attack (Fisher exact test; $p = 1.00$; 95% CI [−0.1686, 0.1259]). Groups did not differ significantly in scores on the self-rated ($t[42] = 1.31$; $p = 0.20$; $d = 0.401$, 95% CI [−0.208, 1.006]) or informant-rated ($t[34] = 0.51$; $p = 0.61$; $d = 0.172$, 95% CI [−0.488, 0.829]) Subjective Cognitive Decline questionnaire.[30] Similar proportions of participants in the two groups were clinically diagnosed as having normal cognition (95% CI [−0.2538, 0.3267]), MCI (95% CI [−0.2661, 0.2822]), or probable AD dementia (95% CI [−0.3104, 0.2213]) based on the full ADRC evaluation ($X^2 = 0.11$; $p = 0.95$).

Scores on several measures of social determinants of health are presented in Table 4. Participants successfully enrolled via each recruitment pathway did not differ significantly in ratings on the Psychological Acculturation Scale[32] (self-rating: $t[41] = -0.43$; $p = 0.67$; $d = -0.135$, 95% CI [−0.746, 0.478], informant rating: $t[33] = 0.57$; $p = 0.57$; $d = 0.195$, 95% CI [−0.748, 0.865]), the Short Acculturation Scale[33] (self-rating: $t[41] = -1.27$; $p = 0.21$; $d = -0.395$, 95% CI [−1.010, 0.225], informant rating: $t[32] = -0.21$; $p = 0.83$; $d = -0.074$, 95% CI [−0.750, 0.604]), or the Health Access Questionnaire[34,38] (self-rating: $t[42] = 0.77$; $p = 0.44$; $d = 0.237$, 95% CI [−0.368, 0.838], informant rating: $t[32] = 0.22$; $p = 0.83$; $d = 0.077$, 95% CI [−0.606, 0.760]). Groups did not differ significantly on the Perceived Stress Scale[36] ($t[37] = 1.38$; $p = 0.18$; $d = 0.460$, 95% CI [−0.205, 1.120]). There was no significant difference between groups in the Area Deprivation Index[35] state decile ($t[44] = 1.20$; $p = 0.24$; $d = 0.357$, 95% CI [−0.232, 0.943]) or national percentile ($t[44] = 1.18$; $p = 0.25$; $d = 0.351$, 95% CI [−0.239, 0.936]) for the location of their primary residence.

The percentages of participants enrolled via each recruitment pathway who verbally agreed to complete, and who actually completed, various ADRC research procedures are shown in Table 5. Groups did not differ significantly in the proportion of individuals who verbally agreed to MRI (Fisher exact test; $p = 0.37$; 95% CI [−0.1316, 0.4393]), LP (Fisher exact test; $p = 0.12$; 95% CI [−0.2925, −0.01516]), amyloid or tau PET (Fisher exact test; $p = 0.38$; 95% CI [−0.07996, 0.3261]), or brain donation (Fisher exact test; $p = 1.00$; 95% CI [−0.3151, 0.2459]), or in the proportion of individuals who completed each procedure (MRI: Fisher exact test; $p = 0.37$; 95% CI [−0.1388, 0.4234], LP: Fisher exact test; $p = 0.12$; 95% CI [−0.2925, −0.01516], PET: Fisher exact test; $p = 0.38$; 95% CI [−0.07996, 0.3261]).

4 | DISCUSSION

Our program successfully trained Promotores to conduct ADRD outreach and recruitment in the H/L community, increasing awareness and research participation. Promotores' knowledge about research methods, ethics, and ADRD-related procedures increased substantially from pre- to post-training (BRIC from 36% to 88%; ADRD knowledge from 72% to 96%). These gains are consistent with prior Promotores programs in which knowledge about brain health increased significantly,[13] are greater than improvements reported in peer-based dementia education networks,[19] and are similar to gains seen after Parkinson's

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TABLE 2 Satisfaction survey responses regarding Promotores participation in the SMADRC training program ($n = 8$). The mean, SD, and range of ratings provided by the Promotores after 24 months of community outreach and recruitment are presented. Survey questions were answered on a five-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

Survey question	Mean	SD	Range
The video training gave me an understanding about research participants' rights (e.g., informed consent, confidentiality, right to withdraw).	4.25	1.49	1–5
The video training gave me an understanding about the researcher's roles and responsibilities to the research participants.	4.88	0.35	4–5
The video training helped me understand the importance of the research procedures included in the SMADRC studies (e.g., cognitive testing, LP, MRI, PET, brain autopsy).	3.88	1.36	2–5
The video training helped me understand the processes involved in participating in the research procedures at the SMADRC (e.g., cognitive testing, LP, MRI, PET, brain autopsy).	3.88	1.25	2–5
The video training content was relevant to my job duties involved in representing SMADRC at community events to disseminate information about Alzheimer's disease and related dementias research opportunities.	3.75	1.04	3–5
I feel confident applying the new knowledge I learned during the video training to engage in the following activities: tabling in the community, explaining research study opportunities and answering questions, recruiting members of the community for research participation.	3.00	0.93	2–5
The monthly meeting training gave me an understanding about brain changes in normal aging, dementia, and Alzheimer's disease.	3.38	0.74	3–5
The monthly meeting training gave me an understanding about the importance of including diverse participants (i.e., those from different ethnic, racial, socioeconomic backgrounds) in Alzheimer's disease and related dementias (ADRD) research studies.	4.63	0.52	4–5
The monthly meeting training helped me understand the importance of the research procedures included in the SMADRC studies (e.g., cognitive testing, LP, MRI, PET, brain autopsy).	4.13	0.99	3–5
The monthly meeting training helped me understand the processes involved in participating in the research procedures at the SMADRC (e.g., cognitive testing, LP, MRI, PET, brain autopsy).	4.50	0.76	3–5
The monthly meeting training content was relevant to my job duties which include representing the SMADRC at community events to disseminate information about ADRD research opportunities.	4.63	0.74	3–5
I feel confident applying the new skills I learned during the monthly meeting training when I am tabling in the community, providing education about Alzheimer's disease research opportunities and answering questions, and recruiting members of the community for research participation.	4.00	0.93	3–5
The SMADRC supplies me with the knowledge I need to do my job providing outreach in the Latinx/Hispanic community by representing the SMADRC at events/tabling to generate research referrals.	4.37	0.92	3–5
The SMADRC supplies me with the appropriate educational materials that I need to do my job providing outreach in the Latinx/Hispanic community by representing the SMADRC at events/tabling to generate research referrals.	4.63	0.74	3–5
The SMADRC provides me adequate resources (financial, logistic) to do my job providing outreach in the Latinx/Hispanic community by representing the SMADRC at events/tabling to generate research referrals.	3.88	1.46	1–5
The process of making a referral for SMADRC is straightforward.	3.38	1.41	1–5
The Latino/a/Hispanic community feels trust toward the SMADRC.	4.13	1.13	2–5
We are providing a valuable service to the Latinx/Hispanic community when we table at community events on behalf of the SMADRC.	4.13	0.84	3–5
We are able to attract appropriate Latinx/Hispanic potential participants to our outreach tables and educational events.	4.00	0.76	3–5
Participants I have referred to the SMADRC have successfully enrolled in research.	4.25	0.89	3–5
My referrals to the SMADRC who have successfully enrolled and have had a positive experience.	4.37	0.74	3–5
The individuals I refer for research will benefit from participation in SMADRC studies.	4.75	0.46	4–5

Abbreviations: ADRC, Alzheimer's disease and related dementias; LP, lumbar puncture; MRI, magnetic resonance imaging; PET, positron emission tomography; SD, standard deviation; SMADRC, Shiley-Marcos Alzheimer's Disease Research Center.

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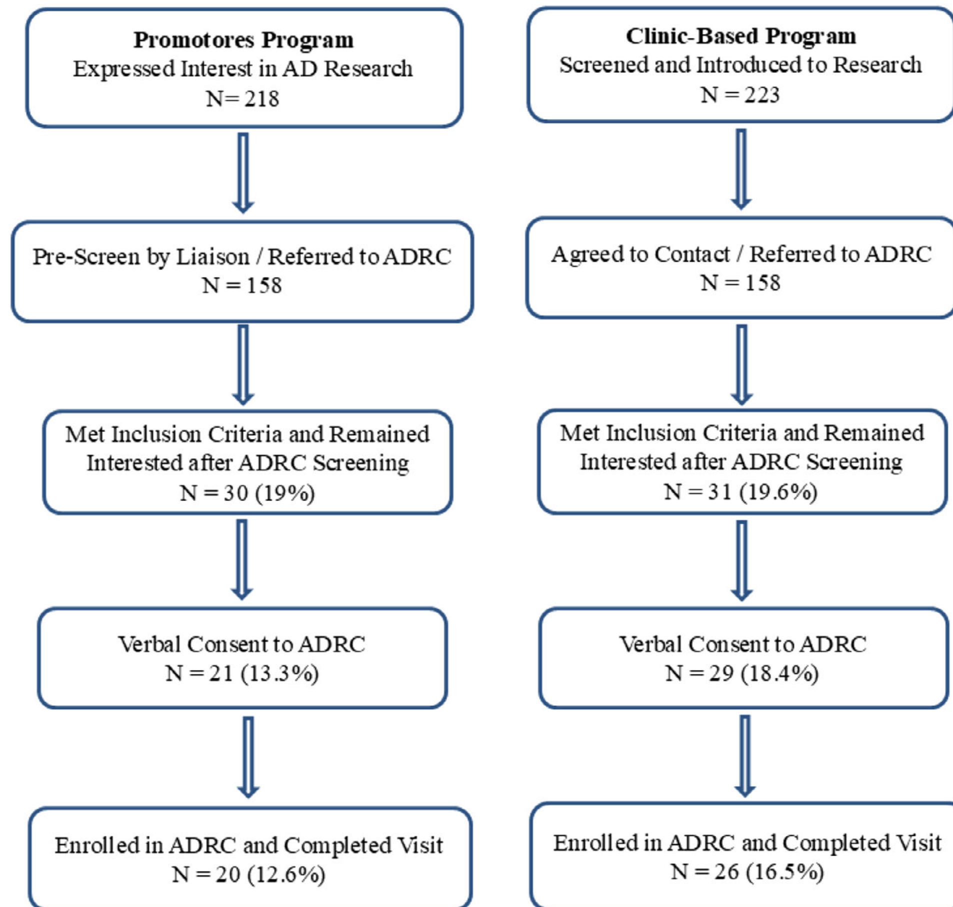

FIGURE 1 The flow of participants who expressed interest and agreed to be contacted about Alzheimer's disease (AD) and related dementias research opportunities through the Promotores and clinical-based cognitive screening programs. The numbers referred to the Alzheimer's Disease Research Center (ADRC) from each source, and the numbers and percentages of those who met ADRC inclusion criteria and remained interested, verbally consented to ADRC participation, and ultimately enrolled and completed a baseline visit at the ADRC are shown.

disease education training.[39] Consistent with satisfaction reported in similar programs,[13] Promotores expressed a high degree of satisfaction with the training program and viewed ADRD research as beneficial, feeling that they were providing an important service. Ongoing monthly continuing education with bilingual ADRC faculty and staff, as well as guests from community organizations, likely supported motivation and engagement.

The Promotores were generally as effective as a traditional clinic-based approach in recruiting older H/L adults into ADRD research over a 36-month period, with 18.9% meeting inclusion/exclusion criteria after additional screening and 12.5% enrolled compared to 19.6% meeting inclusion/exclusion criteria after additional screening and 16.5% enrolled through the clinic-based approach. This similar success supports Promotores as an effective strategy for recruiting older H/L adults into ADRD research with biomarker and cognitive assessments,[25,40] aligning with prior work demonstrating effectiveness of Promotores in improving H/L recruitment for observational and interventional research across various medical conditions[41,42] and extending its applicability to older adults with cognitive impairment. Contributing factors likely included shared cultural and linguistic background with participants;[43] adequate research training and covered program costs;[44] structured support through a dedicated ADRC liaison to facilitate training, monthly meetings, and reporting; monetary incentives for successful referrals; and ongoing opportunity for Promotores to provide feedback and remain engaged. Table S1 in supporting information summarizes lessons learned during the development of the Promotores program and Table S2 in supporting information provides comparative costs of initiating and maintaining the two recruitment approaches.

When comparing the participants enrolled through Promotores and clinic-based approaches, we found no significant difference on any demographic characteristic, self-reported measures of social determinants of health, preference for testing in Spanish (> 90% in both samples), degree of subjective cognitive decline, or mental status test scores. Furthermore, there was no significant difference in the proportion of those enrolled from each source who received classification as normal cognition, MCI, or probable AD based on the comprehensive ADRC clinical evaluation, providing further validation of the Promotores approach to H/L recruitment into ADRD research. This conclusion should be tempered, however, by factors that may

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TABLE 3 Demographic characteristics (means and SD or percentages), mental status test scores, depression scores, and subjective cognitive decline scores for participants recruited via Promotores versus clinic-based pathways. Effect sizes (Cohen *d* or CIs) for group differences and *p* values for *t* tests are shown. Number of participants in each group with missing data are shown in parentheses (after mean and SD or percentages).

	Promotores ($n = 20$)	Clinic-based cognitive screening ($n = 26$)	Effect size, *p*
Age (years)	73.3 (7.1)	69.8 (5.8)	$d = -0.54$, $p = 0.08$
Education (years)	10.4 (5.8) (2)	9.5 (4.0)	d = −0.18, $p = 0.57$
Sex (% female)	80%	58%	Exact test* $p = 0.13$
Tested in Spanish (% yes)	90%	100%	Exact test $p = 0.18$
Mini-Mental State Examination[25]	24.0 (6.9) (1)	26.1 (3.7)	$d = 0.39$, $p = 0.20$
Montreal Cognitive Assessment[26]	17.7 (6.8) (1)	18.9 (4.3)	$d = 0.21$, $p = 0.49$
Geriatric Depression Scale[27]	1.3 (2.5)	1.5 (1.6)	$d = 0.14$, $p = 0.64$
Functional Activity Questionnaire[28]	6.3 (9.1) (3)	4.6 (6.1)	$d = 0.23$, $p = 0.47$
Medical history (% yes)			
Traumatic brain injury	16.7% (2)	19.2%	Exact test* $p = 1.00$
Stroke/transient ischemic attack	5.6% (2)	7.7%	Exact test $p = 1.00$
Subjective cognitive decline[29]			
Self-rating	5.3 (6.3) (2)	7.9 (6.6)	$d = 0.40$, $p = 0.20$
Informant rating	8.7 (8.6) (4)	10.0 (6.2)	$d = 0.17$, $p = 0.61$
ADRC diagnosis			
Normal cognition	42% (1)	38%	95% CI* [−0.25, 0.33]
Mild cognitive impairment	32%	31%	95% CI [−0.26, 0.28]
Probable Alzheimer's disease	26%	31%	95% CI [−0.31, 0.22]

Abbreviations: ADRC, Alzheimer's disease and related dementias; CI, confidence interval; SD, standard deviation.
*95% CI for the difference between proportions; *Fisher exact test.

have heightened the similarities of those enrolled through the two pathways. First, inclusion/exclusion criteria for the ADRC longitudinal observational study constrain enrollment, excluding many individuals initially referred who do not meet the study inclusion criteria, thus making the sample less heterogeneous. It is possible that those initially referred from each source had different characteristics, which were reduced through the ADRC secondary screening process. Second, The Neuron Clinic is located in the same area of San Diego County in which the Promotores live and operate, increasing the probability of similarities in those recruited through each source. Third, the sample size for these comparisons is very small and should be interpreted with caution. It should be noted that even though we found no statistically detectable large differences between the two recruitment pathways, the effect sizes and 95% CIs around these estimates are compatible with small-to-moderate differences in either direction, thus we cannot rule out the possibility that one pathway may be modestly more or less efficient than the other. However, these factors do not account for the similarity in diagnostic classifications for the two pathways. This finding suggests that Promotores can successfully identify and recruit individuals across the spectrum from cognitively normal to MCI to AD dementia into ADRD-related clinical studies after receiving appropriate training.

We also addressed whether individuals enrolled through the Promotores program would have similar agreement as those from the clinic-based approach to participate in various ADRD research procedures. We anticipated that those from the clinic may be more likely to view ADRC participation as an adjunct to their clinical care and complete these procedures. However, there was no significant difference in the proportions of individuals from each recruitment source who agreed to, and completed, brain MRI, amyloid PET imaging, or LP, although the proportions were quite low for LP (0%–15%). Additionally, ≈ 35% from each source agreed to brain autopsy. These results highlight the need to increase the number of older H/L participants who agree to complete these important procedures. We believe that once enrolled, individuals build trust and feel more comfortable with research and may then agree to participate as staff revisit the importance of these procedures in the future. Moreover, the Promotores may play an important role in providing education about these procedures, an approach shown effective in the H/L population of Texas, where trained Promotores helped increase the perceived benefits and intention of participating in clinical trials and biobanking, as well as reduce perceived barriers to participation.[45]

The following limitations should be noted. First, not all Promotores attended all aspects of the training program or completed all

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TABLE 4 Social determinants of health measures (means and SDs) for participants recruited via Promotores or clinic-based pathways. Effect sizes (Cohen d) for group differences and p values for t tests are shown. Number of participants in each group with missing data are shown in parentheses (after mean and SD).

	Promotores ($n = 20$)	Clinic-based cognitive screening ($n = 26$)	Effect size, p
Psychological acculturation scale[32]			
Self-rating	2.49 (1.41) (3)	2.32 (1.16)	$d = -0.14, p = 0.67$
Informant rating	2.78 (1.34) (5)	3.11 (1.87) (6)	$d = 0.20, p = 0.57$
Short acculturation scale[33]			
Self-rating	20.9 (7.1) (3)	18.2 (6.6)	$d = -0.40, = 0.21$
Informant rating	21.8 (6.4) (5)	21.2 (9.0) (7)	$d = 0.07, p = 0.83$
Health access questionnaire[34,35]			
Self-rating	11.1 (3.7) (3)	12.2 (4.8)	$d = 0.24, p = 0.44$
Informant-rating	11.5 (4.2) (6)	11.9 (5.7) (6)	$d = 0.08, p = 0.83$
Area Deprivation Index[36,37]			
State decile	6.6 (2.0)	7.2 (1.9)	$d = 0.36, p = 0.24$
National percentile	23.0 (19.9)	31.9 (28.8)	$d = 0.35, p = 0.08$
Perceived stress scale[38]			
Total score	8.3 (5.0) (6)	11.1 (6.6) (1)	$d = 0.54, p = 0.18$

Note: Psychological Acculturation Scale (range 1–9, higher scores reflect greater acculturation to mainstream culture); Short Acculturation Scale (range 12–60, higher scores reflect greater acculturation to mainstream culture); Health Access Questionnaire (range 6–30, higher scores indicate less perceived access to care); Area Deprivation Index State Decile (1–10, 1 = least disadvantaged, 10 = most disadvantaged); Area Deprivation Index National Percentile (1–100, 1 = least disadvantaged, 100 = most disadvantaged); Perceived Stress Scale (range 0–40, higher scores indicate greater stress).
Abbreviation: SD, standard deviation.

TABLE 5 Amenability and participation in Alzheimer's disease research procedures. The p values for Fisher exact tests are shown. No missing data.

	Promotores ($n = 20$)	Clinic-based cognitive screening ($n = 26$)	p value*
Magnetic resonance imaging			
Agreed	50.0%	34.6%	$p = 0.37$
Completed	45.0%	30.8%	$p = 0.37$
Lumbar puncture			
Agreed	0%	15.4%	$p = 0.12$
Completed	0%	15.4%	$p = 0.12$
Amyloid or tau positron emission tomography			
Agreed	20.0%	7.7%	$p = 0.38$
Completed	20.0%	7.7%	$p = 0.38$
Brain autopsy			
Agreed	35.0%	38.5%	$p = 1.00$

*p value.

procedures. For example, only seven of the nine Promotores completed the ADRC video pre-/post-tests, and only eight completed the satisfaction survey. Attendance at the monthly continuing education meetings averaged 71% over 2.5 years. Ways to incentivize training and program compliance need further attention. Currently, the only incentive is a remuneration for participants successfully enrolled and formalized university volunteer status with identification and access to software and facilities.[46] Second, because the Promotores all lived in the same geographic area, the program was deployed mostly in one geographic region (southwest San Diego County). Productivity of the program

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might be enhanced by spreading outreach to additional H/L communities. Third, the Promotores did not have training in objective mental status testing that could allow targeted recruitment of individuals with MCI or early dementia.[14,15] A future direction is to train Promotores to perform cognitive screening with objective instruments such as the Mini-Mental State Examination, AD8,[47] or Mini-Cog[48] to guide their recruitment efforts.

In summary, the Promotores program achieved its educational goals and was a successful strategy for recruitment of older H/L adults into ADRD longitudinal observational research. The number of participants enrolled, and their demographic, social, medical history, and cognitive features, were comparable to a traditional clinic-based approach, adding to the very few research capacity-building training programs for Spanish-speaking Promotores.[49] Our results also support a multipronged community-oriented approach to H/L recruitment.[50] Both Promotores and clinic-based cognitive screening approaches empowered communities by increasing awareness, providing opportunities for research participation, and offering education to inform decisions and guide actions related to coping with ADRD.[12]

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CONFLICT OF INTEREST STATEMENT

Dr. David Salmon has been a paid consultant for Aptinyx and Biogen. Dr. Douglas Galasko received payment as a consultant to Eisai, Eli Lilly, Roche Diagnostics, Cognition Therapeutics, and for serving on a DSMB for Artery Therapeutics. All other authors have no conflicts of interest to declare. Author disclosures are available in the supporting information.

CONSENT STATEMENT

All ADRC longitudinal study procedures were reviewed and approved by the UCSD Institutional Review Board. Consent was not necessary from the Promotores to volunteer their time for participant recruitment nor for program evaluation. All participants who enrolled in the ADRC longitudinal study via either Promotores recruitment or through clinic-based recruitment provided signed informed consent. Prior to obtaining consent, all participants were thoroughly informed of all study procedures, were given time to ask questions and voice any concerns, were informed that research is voluntary and they can withdraw from the longitudinal study at any time. After all questions were answered and thorough understanding of the risks and benefits of participation were clear, signed informed consent was obtained from all participants.

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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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