

Adaptation of a Multidomain Behavioral Intervention for Dementia Prevention in Hispanic/Latino Adults: Protocol to Guide an Evidence-Based Cultural Adaptation

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ABSTRACT

OBJECTIVE: Alzheimer's disease and related dementias (ADRD) pose a growing public health challenge, with 45% of cases attributable to 14 modifiable risk factors. Midlife represents a critical window for prevention. Hispanic/Latino adults face disproportionate ADRD risk, compounded by health inequities such as limited health-care access and higher prevalence of cardiovascular and metabolic conditions. In Rhode Island, where 17.6% of residents identify as Hispanic/Latino, culturally tailored interventions are urgently needed. This study aims to inform the cultural adaptation of the TEACH intervention (Tailored Education for Aging and Cognitive Health), an evidence-based, multidomain behavioral intervention designed to reduce ADRD risk through lifestyle modification, to ensure its cultural relevance for Hispanic/Latino adults.

DESIGN AND METHODS: The research team will follow the Cultural Adaptation Process (CAP) model to guide the adaptation of the TEACH intervention, emphasizing linguistic and cultural relevance for Hispanic/Latino adults in southern New England by incorporating the views and perspectives of key stakeholders. We will conduct semi-structured qualitative interviews with bilingual stakeholders (N=6-8) and Hispanic/Latino adults aged 40-69 (N=10-12) recruited from clinical and community settings. Interviews will explore brain health beliefs, perceived intervention needs, barriers, and cultural values. Qualitative data will be analyzed using framework matrix and applied thematic analysis approaches to identify adaptation priorities across language, content, and delivery.

RESULTS: This project was funded in September 2023. Data collection began in 2024, and analysis is projected to be completed in 2026.

CONCLUSIONS: Findings will guide cultural adaptation of the TEACH intervention using the CAP model. This work addresses a critical gap in ADRD prevention for U.S. Hispanic/Latino populations and lays the foundation for a future randomized controlled trial to evaluate efficacy of the adapted intervention.

KEYWORDS: Alzheimer's disease and related dementias; dementia prevention; cultural adaptation; Hispanic/Latino; Latinx; behavioral intervention

INTRODUCTION

Alzheimer's disease and related dementias (ADRD) are a growing health concern, with major implications for individuals, families, and healthcare systems. A recent report from the Lancet Commission on Dementia Prevention identified 14 modifiable risk factors that account for 45% of dementia cases worldwide.¹ Modifying risk factors such as low physical activity, increased stress, and social isolation in middle age and early older adulthood could prevent or delay the onset of ADRD. Neuropathologies start to accumulate 10-15 years before the onset of symptoms, making middle age a critical window for ADRD intervention.^{2,3}

This early intervention period is particularly important for populations such as Hispanic/Latino Americans who are at elevated risk for developing AD and constitute a rapidly growing segment of the U.S. population. Hispanic/Latinos in the U.S. are 1.5 times more likely than non-Hispanic Whites to develop Alzheimer's disease and related dementias (ADRD) and 12% of older adults in the Hispanic/Latino population are diagnosed with Alzheimer's disease.^{4,5} Between 2022 and 2023, Hispanic individuals accounted for nearly 71% of total U.S. population growth, contributing the majority of the overall population gain.⁶ Hispanic/Latinos of any race now make up approximately one-fifth of the U.S. population, the largest group after non-Hispanic Whites. This rapid growth emphasizes the public health relevance of ADRD disease prevention efforts in Hispanic/Latino communities.

ADRD rates differ across Hispanic/Latino subgroups, which is thought to be due to migratory, cultural, and socioeconomic differences, among other factors. For example, ADRD rates are disproportionately higher among individuals of Caribbean Latino subgroups (e.g., Puerto Rican, Dominican, and Cuban) compared to non-Hispanic White adults and Latino individuals from Central American or Mexican origin.⁷ This is particularly salient for intervention efforts in Rhode Island, where the majority of Latino residents are of Dominican (4.9% of the total RI population)

and Puerto Rican (3.8%) origin. This subgroup-specific risk profile makes culturally and linguistically responsive intervention strategies especially critical for effective engagement.

Elevated ADRD risk in Hispanic/Latino older adults is, in part, related to individual health risk factors, such as higher rates of overweight/obesity,⁸ cardiovascular disease,⁹ diabetes,¹⁰ and hypertension,⁹ compared to non-Hispanic Whites. However, these are associated with and compounded by societal barriers, including economic disparities, higher rates of un- or under-insurance, lower access to medical resources, cultural and linguistic barriers, and discrimination.¹¹ These health inequities are particularly acute in Rhode Island, where in 2022, 21% of the Hispanic/Latino population was uninsured, 23.7% reported having no doctor, and 17.6% reported being unable to afford medical care.¹² Therefore, there is a strong need for scalable, culturally appropriate, lifestyle medicine interventions to reduce risk for ADRD.

Multi-domain interventions targeting lifestyle factors have been shown to reduce ADRD risk in older adults in U.S. and international studies.¹³ For example, the U.S. POINTER study randomized 2,111 older adults at elevated risk for ADRD to a structured lifestyle intervention, including physical activity, dietary recommendations, cognitive challenge, social engagement, and cardiovascular health monitoring, compared to a lower-intensity self-guided intervention. The study found that the structured, multidomain, behavioral intervention showed greater cognitive benefits over two years compared to the self-guided intervention, providing evidence for the efficacy of this approach. However, only 5.9% of participants enrolled in the U.S. POINTER trial identified as Hispanic/Latino despite representing 19.5% of the total U.S. population.⁹ Because these interventions are often designed for English-speaking, non-Hispanic White populations, they may not be culturally appropriate or address the barriers faced by Hispanic/Latino individuals.⁴ This raises concern about the generalizability of these findings to this growing population.

The goal of this study is to lay the groundwork for a cultural adaptation of a multidomain behavioral intervention, Tailored Education for Aging and Cognitive Health (TEACH). The existing TEACH intervention was designed using principles from the science of behavior change to motivate long-term maintenance of target health behaviors to prevent or delay the onset of ADRD. TEACH has been delivered to English-speaking middle-aged adults in an eight-week, video conference-based format, which makes it briefer and potentially more scalable than the two-year, in-person group sessions in the U.S. POINTER trial. The intervention provides education about modifiable risk factors for ADRD, along with a structured framework for goal setting and problem solving for long-term behavior change. One of the core elements of the TEACH intervention is using the Health Belief Model to educate participants about health belief factors, including perceived threat of disease, perceived benefits, and

self-efficacy.¹⁵ Participants undergo a comprehensive assessment of modifiable ADRD risk factors and intrapersonal health beliefs. They receive a profile showing their scores on seven intrapersonal health belief factors, including future-time perspective, self-efficacy, reward sensitivity, response inhibition, executive control, consideration of future consequences, and ability to defer gratification. By integrating personalized education about these intrapersonal health beliefs with targeted information about modifiable ADRD risk factors, TEACH gives individuals a tailored framework for initiating and sustaining health behavior changes relevant to their own ADRD risk.

Research shows that culturally adapted treatments are more effective than their non-adapted versions, particularly when they incorporate adapted language and culturally relevant values.¹⁴ We therefore will adapt TEACH for Hispanic/Latino adults living in southern New England, many of whom are from Caribbean and Central American heritage groups. This study will use the Cultural Adaptation Process (CAP) model to culturally adapt the TEACH intervention for Rhode Island Hispanic/Latino adults. The CAP model is an evidence-based framework for adapting interventions to better fit target populations, using Bronfenbrenner's Ecological Validity Model to guide adaptation along eight relevant dimensions.¹⁶ The model emphasizes collaboration between researchers, community stakeholders, cultural experts, and community members to ensure that adaptation is relevant. The CAP model has three primary phases. The first phase, which is the focus of this study, involves identifying the need for adaptation, reviewing relevant empirical and cultural literature, and involving stakeholders from the community to evaluate cultural fit and barriers. The second phase focuses on modifying intervention content and delivery through surface (e.g., language translation) and deep (e.g., incorporating cultural beliefs and social norms that influence behavior) structure adaptations. Finally, the third stage involves pilot testing the adapted intervention, evaluating the feasibility, and refining the intervention based on the feedback and outcome data.

METHODS

Stakeholder Interviews

We will conduct individual, semi-structured, qualitative interviews with key multilingual and multicultural stakeholders, including community leaders, healthcare providers who serve predominantly Hispanic/Latino patients in Rhode Island, and Hispanic/Latino adults who are potential end users of the intervention (2-3 per stakeholder group). Stakeholders will be purposively selected based on their professional roles, community engagement, and experience with working with Hispanic/Latino adults.

Interviews will be conducted in either English or Spanish based on stakeholder preference and will last 30–45 minutes.

All interviews will be digitally audio-recorded and transcribed. Spanish language interviews will be transcribed in Spanish and translated into English for analysis by the wider study team, though Spanish-speaking study team members will ensure that cultural and linguistic nuance is maintained when interpreting findings.

A semi-structured interview guide has been developed to draw out stakeholders' perspectives on brain health, ADRD, and the cultural adaptation of TEACH. This was informed by the CAP model, which uses the Ecological Validity Model to identify eight dimensions across which an intervention may need to be adapted [Table 1].¹⁶ Interview questions focused on two primary areas: the perceived need for a brain health intervention and developing a culturally adapted version of TEACH. Regarding perceived need for brain health interventions, stakeholders will be asked about common cultural beliefs related to brain health and aging within their local community (e.g., whether dementia is perceived as preventable, where community members receive information about ADRD). We will specifically elicit information about awareness of modifiable risk factors for ADRD. Intervention development questions will address potential barriers within the stakeholders' local community (e.g., time constraints, trust of healthcare establishments, access to technology), elements that would enhance the effectiveness of the intervention, and culturally relevant values or

practices that should be incorporated into the program (e.g., *familismo*, a Hispanic/Latino cultural value emphasizing family closeness and wellbeing; specific Spanish words or phrases that may promote understanding of core intervention targets, and relevant community norms). Stakeholders will also be asked to identify qualities that are perceived as important to promote acceptability of the intervention (e.g., intervention being led by a healthcare provider versus community health worker, importance of bilingual and/or bicultural interventionist, intervention setting).

Individual Qualitative Interviews

To prepare for adaptation of intervention content, we will conduct 10–12 individual qualitative interviews with Spanish speaking participants recruited from the Rhode Island Hospital Neuropsychology Program and through community organizations and events (e.g., libraries and community centers). We will enroll participants aged 40–69, as this is the target age for the TEACH intervention. We will purposively sample to ensure representation from multiple countries of origin reflective of Rhode Island's Hispanic/Latino demographics (e.g., Dominican Republic, Puerto Rico, Guatemala, Mexico). Individual interviews were preferred over focus groups because of the potential to collect in-depth personal perspectives on health beliefs and behavior change for topics that may be sensitive or abstract. During interviews, participants will be presented with descriptions of seven health belief constructs that have been identified as mediators or moderators of health behavior change: future time perspective,¹⁷ consideration of future health consequences,¹⁸ delay discounting,¹⁹ deferment of gratification,²⁰ response inhibition,²¹ executive control,²² and self-efficacy.²³ Participants will be asked to reflect on the acceptability, appropriateness, applicability, and perceived relevance of each construct to their own health behaviors and perceived risk for ADRD.

A phenomenographic approach will guide the interview process. Phenomenography is a well-established qualitative method used to examine how individuals understand and experience certain concepts within educational and healthcare settings.^{24,25} This approach focuses on two aspects of learning: the referential aspect (the meaning individuals give to a concept) and the structural aspect (how the concept relates to their own experience). For example, interview questions will address appropriateness of intervention concepts (e.g., "In your own words, what does self-efficacy mean?") and applicability (e.g., "Does self-efficacy feel relevant to your own health, in relation to your risk for dementia?"). Interviews will be conducted both in person and remotely to increase accessibility. All interviews will be audio-recorded, transcribed, and translated into English for analysis.

Qualitative Analysis

In consultation with the Advance RI-CTR Biostatistics,

Table 1. Dimensions of cultural adaptation from Ecological Validity Model, which is embedded in the Cultural Adaptation Process Model

Dimensions	TEACH Adaptation
Language	Professional Spanish translation; refinement of language by working group
	Evaluate appropriateness for those with lower literacy skills
Persons	Consider cultural context and traditions for different Latino origin groups
	Intervention delivery by bilingual/bicultural providers
Metaphors	Incorporate <i>dichos</i> (sayings or proverbs) and specific language participants use to describe health
Content	Incorporate cultural knowledge about values, traditions, and customs
Concepts	Evaluate health belief descriptions to ensure they are culturally appropriate
	Adapt intervention concepts (e.g., diet or physical activity recommendations) to align with cultural context
Goals	Ensure goal-setting framework aligns with positive cultural values
Methods	Consider logistics of intervention delivery (e.g., preferences for in-person vs online format, location)
	Develop measure of intervention fidelity
Context	Incorporate social determinants of health and structural barriers to behavior change into the intervention

Epidemiology, and Research Design (BERD) core, we created an analysis plan for qualitative data. To rapidly integrate stakeholder perspectives into the planned intervention adaptation, we will use a framework matrix approach.²⁶ A framework will be developed based on codes and summaries of participants' comments will be abstracted from the qualitative agenda. Relevant quotes will also be collected and entered into a matrix summaries. Two team members will review the matrix and summarize key codes for completeness and accuracy.

To ensure a rich understanding of participants' experiences, we will use an applied thematic analysis approach for the individual qualitative interviews. A codebook of both deductive and inductive codes will be created. Deductive codes will be developed based on the study aims and theoretical frameworks guiding the research, including health belief concepts and cultural adaptation domains. Inductive codes will be generated from participants' responses and feedback to capture themes. Code summaries will be written, reviewed and discussed with the study team. Data will be managed and coded using NVivo software.

DISCUSSION, IMPACT, AND FUTURE DIRECTIONS

The goal of this study is to adapt a personalized, multi-domain, behavioral intervention for primary prevention of ADRD in middle-aged Hispanic/Latino adults in Rhode Island and neighboring areas. While international studies such as the Latin American Initiative for Lifestyle Intervention to Prevent Cognitive Decline (LatAm-FINGERS) are currently underway, there are no known multidomain behavioral interventions for dementia prevention adapted for a U.S. Hispanic/Latino population.²⁷ This is a critical gap, given the growing U.S. Hispanic/Latino population and disproportionately higher prevalence of modifiable risk factors that increase dementia risk.

Following completion of data collection, we will review qualitative data from stakeholders and potential end users of the intervention. While the relevant empirical and cultural literature points to a need for culturally adapted interventions for Hispanic/Latino adults at risk for ADRD, the CAP model asks that we consider whether the community has an identified need for intervention adaptation and how stakeholders evaluate cultural fit and potential barriers. These data will directly address these considerations and will inform the next phase of the CAP model, which is to modify intervention content at both the surface level (translation of intervention materials into Spanish) and deep level (incorporating important cultural beliefs or community norms). Because the intrapersonal health belief constructs are conceptually abstract, we specifically elicit words and phrases from participants that can be used to describe these concepts effectively. The goal is to not only translate intervention material into Spanish, but to ensure its cultural relevance

and appropriateness for our local community, considering language dialects, acculturation status, common idioms, and cultural norms.

There is a robust literature in implementation science examining contextual determinants of implementation outcomes.²⁸ Patient perspectives, clinician characteristics, organizational and health care systems, and broader socio-cultural context all affect the adoption, effectiveness, and maintenance of interventions. These factors are especially important to consider when adapting an intervention to a different population or cultural context, as the core intervention elements and mechanisms of action may differ across settings. We therefore view the present study as a preliminary step in the adaptation of the TEACH intervention. Considering the perspectives of stakeholders, including community members and prospective end users of the intervention, will provide data about the perceived need of a health behavior intervention, core intervention characteristics, appropriateness of the methods, and implementation determinants.

In conclusion, this study will directly prepare our team to conduct a community-informed linguistic and cultural adaptation of the TEACH intervention, with a long-term goal of designing a randomized controlled trial to examine the efficacy of TEACH versus basic health education in U.S. Hispanic/Latino. This has the potential to address health disparities and reduce risk of ADRD through long-term maintenance of target behaviors to promote brain health.

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Disclosures

Funding: This study was supported by a Pilot Award (PI: Korthauer) offered by Advance RI-CTR [U54GM115677], which is sponsored by the National Institute of General Medical Sciences (NIGMS), Institutional Development Award Program Infrastructure for Clinical and Translational Research (IDeA-CTR) and NIH R21AG075328 (MPI: Korthauer and Davis).

Acknowledgments: Laura Korthauer and Rochelle Rosen are partially supported by Institutional Development Award Number U54GM115677 from the National Institute of General Medical Sciences of the National Institutes of Health, which funds Advance Rhode Island Clinical and Translational Research (Advance RI-CTR). Support from the Biostatistics, Epidemiology and Research Design (BERD) and Community Outreach and Engagement (CEO) cores was received. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Ethical Approval: This study was reviewed and approved by the Institutional Review Board (IRB) at Brown University Health. Data will be managed in accordance with institutional and ethical guidelines to ensure participant confidentiality.

COI Statement: The authors have no conflicts of interest to disclose.

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