Addressing Digital Disparities in Alzheimer's Disease: Improving Access to Alzheimer's Resources for Spanish-speaking Latino/as in Los Angeles County

Stephanie Ovalle- Eliseo, Aisha Mohammed, Gabriela Islas-Huerta, Keith Vossel, Lorena Monserratt, Mirella Díaz-Santos

Table of Contents

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Abstract

Background: The COVID-19 pandemic disrupted traditional healthcare delivery models, exacerbating disparities between those with and without ready access to digital technology. This digital divide poses a structural barrier to accessing equitable healthy aging resources and dementia care. Latinos and Hispanics, constituting nearly half of Los Angeles County's population and facing a projected tripling of Alzheimer's disease and related dementias (AD) prevalence by 2040, are particularly impacted.

Objective: This paper aims to examine the barriers and facilitators affecting access to digital health education and resources for AD prevention and care management in during the COVID-19 pandemic. This study focuses on the digital barriers possibly hindering Spanish-speaking Latinos and Hispanics in Los Angeles County from utilizing online services offering critical AD prevention and care resources amid the COVID-19 pandemic.

Methods: We developed a conceptual model based on users' digital access/web literacy and language as barriers and facilitators impacting access to digital brain health and AD resources. Between January and February 2022, we identified 15 websites of local organizations providing digital AD preventative services and resources in Los Angeles County during the pandemic. We applied our digital divide model to qualitatively evaluate the 15 websites.

Results: Out of the 15 websites, 5 featured web navigation accessibility tools, 4 provided content available in Spanish, and 2 included resources for family dialogue about AD care and management. One website showed cultural and linguistic responsiveness in their content. We uncovered other unforeseen structural barriers to digital access, including email subscription requirements, English-language centered online forms, and the unavailability of Spanish-speaking staff.

Conclusions: Our study highlights structural barriers hindering access to digital AD health resources and services tailored to the needs and values of Latinos and Hispanic communities living in Los Angeles County. The findings emphasize the need to bridge the digital gap by incorporating user-friendly features and culturally and linguistically responsive elements in website design, and implementation. This approach will move our field towards equitable access to digital brain health services by mitigating structural barriers that sustain AD disparities in Latino and Hispanic communities.

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We have no known conflict of interest to disclose.

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Key Words: *Alzheimer's disease, Web Accessibility; Latinos and Hispanics; Digital Divide, Structural Determinants of Health*

Introduction

Alzheimer's Disease and its Impact on Latinos and Hispanics

Alzheimer's disease (AD) poses an increasing threat to Latinos and Hispanics in America, as they face a 1.5 times higher risk of developing AD [1]. Despite robust efforts, the current treatment options for AD are limited [2-4], necessitating a shift towards preventive measures. This shift involves advocating for healthy aging and fostering increased awareness around brain health within the Latino and Hispanic communities [5]. As AD symptoms appear, effective care management requires a comprehensive network of interventions spanning community connections, including families, friends, and community or faith-based organizations, alongside broader societal,

pharmacological, and policy measures [6]. Acknowledging the crucial roles that knowledge and education have in AD prevention, previous literature indicates that a fundamental understanding of a health condition significantly enhances self-efficacy, empowering individuals to make profound behavioral changes that alleviate negative attitudes towards seeking preventive health services [7-9].

Health Disparities Amid the Digital Transition During the COVID-19 Pandemic

Before the COVID-19 pandemic, numerous resources, such as educational workshops and caregiving support groups, were available in person [10]. Digital platforms also began to provide resources online as the need arose for more accessible information [11]. In the AD field, websites of organizations detailing available AD services and resources to local communities serve as valuable platforms offering preventative health information and dementia care management tools [12-14]. However, the sudden shift to digital platforms exposed stark disparities in access to informational health services, highlighting the digital divide [15-16]. The digital divide refers to the gap between those with adequate access to information via technology and those with limited to no access to technology due to various systemic barriers [17]. The transition to mostly digital resources was particularly challenging for communities disproportionately affected by the pandemic due to systemic barriers, thus widening the existing digital divide [18].

Impact of the Widened Digital Divide on Health Disparities

Despite earnest efforts, engaging with Latino and Hispanic communities via digital platforms has posed significant challenges for many health sectors due to a range of barriers [19,20]. The widened digital divide has further compounded these challenges, as evidenced by lower recruitment and engagement of Latinos and Hispanics in informational sessions and events on AD

during the COVID-19 pandemic, despite increased promotional efforts [21]. Notably, even with recruitment initiatives led by Spanish bilingual staff, attendees were predominantly English-dominant bilingual and college-educated [21,22]. This discrepancy underscores the impact of barriers such as limited technology access and low digital literacy, which hindered participants from effectively engaging online.

Digital literacy, defined as the ability to access, evaluate, understand, and use information and communication technologies effectively, plays a pivotal role in addressing these challenges [23]. It encompasses skills such as navigating digital platforms, critically evaluating online content, as well as communicating and collaborating with digital/virtual communities. In the context of engaging with Latino and Hispanic communities via digital platforms, digital literacy is essential for individuals to access online health resources, participate in virtual events, and engage in digital communication effectively. However, barriers such as limited access to technology and low levels of digital literacy can impede individuals' ability to fully benefit from digital health initiatives, exacerbating existing disparities in health outcomes and access to care [15].

Policy Implications and Telehealth Expansion

Despite the surmounting evidence suggesting that the digital divide critically exacerbates health disparities through inequitable access to digital technology, electronic health (e-health) increased exponentially during the COVID-19 lockdowns. E-health involves health and telehealth practices that employ electronic technologies to provide healthcare resources, services, and information [24]. National policies such as The Affordable Care Act (ACA) and the Health Information Technology for Economic and Clinical Health (HITEC) Act further contribute to the increased use of technology in healthcare by monetarily incentivizing the increased implementation of e-health technologies, such as patient portals, to meet their critical goal of using interoperable electronic health records in the nation's healthcare delivery system [24,25]. Accordingly, during the

COVID-19 pandemic, the federal government expanded coverage of telehealth services via Medicare [26]. These policies neglected to consider equitable distribution of e-health information and resources to the communities at higher risk of AD, such as Latinos and Hispanics, possibly exacerbating the disparities in AD early detection, diagnosis, and care management [27,28].

Socioeconomic, Environmental, and Familial Factors Driving Digital Divide Among Latinos and Hispanics in Los Angeles

Digital disparities faced by the Latino and Hispanic communities predates the sudden surge in digital reliance brought about by the pandemic. A 2016 study showed that 41% of immigrant Latinos and Hispanics below the national median income level had internet access only via a mobile device, compared to 17% of U.S.-born counterparts [26, 29]. Latino and Hispanic immigrants with lower education levels, lower English proficiency (LEP), and lower SES were less likely to seek e-health information due to lower digital literacy [30,31]. Despite the rise in mobile internet usage among Latinos and Hispanics with higher education and income [29], individuals with lower incomes faced difficulties with internet connectivity, providing evidence for the existence of the digital divide [32]. A recent Pew Research Center blog on The Internet and Pandemic found that Latinos and Hispanics comprised a significant portion of the 30% of adults reporting lower "tech readiness" [32]. People with lower tech readiness lacked confidence in using electronic devices for online tasks and were less likely to deem the internet essential during the pandemic.

The prevalence of health information-seeking tendencies among Latinos and Hispanics communities could be attributed to social determinants of health, including barriers beyond internet access [32]. While some groups with low-hazard occupations smoothly transitioned to remote work, Latinos and Hispanics, a significant population with low socioeconomic status (SES), contrarily found themselves on the front lines as essential workers [33]. This reality, coupled with rising worries regarding insecurities in food, housing, and employment, further complicated the

digital transition [34,35]. With the presence of telehealth outlasting the pandemic lockdowns and the widened digital divide gap, it is essential to identify modifiable digital accessibility factors tailored to the needs of the Latino and Hispanic communities, especially pertaining to brain health prevention and AD management. Recent work has demonstrated that digital engagement and internet use are associated with improved cognition, knowledge of AD, and AD-related preventative behaviors [5,36]. Thus, more effort is needed to increase accessibility for those most vulnerable to the digital divide.

Latinos and Hispanics in Los Angeles County make up 48% of the population, and 38% of these individuals also speak Spanish as their primary language [37]. Additionally, this group possess diverse sub-demographics and cultures that uniquely shape their behaviors or attitudes toward seeking healthy aging or dementia care services [19,38,39]. According to the Office of Health Assessment and Epidemiology from the Los Angeles County Department of Public Health [40], results from four of six waves, between 2002 and 2011, of the Los Angeles County Health Survey shed light on the significant socio-economic and access-to-care challenges Latinos and Hispanics face in the region. Socioeconomically, a substantial 43% of Latinos and Hispanics, representing diverse backgrounds such as Mexicans, Central Americans, Cubans, Puerto Ricans, and South Americans, have not attained a high school education level. Furthermore, 38% of Latinos and Hispanics in Los Angeles County fall within the Federal Poverty Level range of 0-99%, highlighting the economic struggles within this population. Access to care is another critical aspect, with 37% of Latinos and Hispanics lacking health insurance and a notable 60% without dental insurance. Unfortunately, 26% of Latino and Hispanic adults do not have a regular source of healthcare, and 43% report difficulties in accessing medical care. Additionally, 39% of adult Latinos and Hispanics disclosed that they did not seek healthcare due to financial constraints, emphasizing the urgent need for targeted interventions to address these disparities and enhance healthcare accessibility for

the Latino and Hispanic communities in Los Angeles County [40].

## Objective and Framework for Studying Digital Health Disparities

The objective of our paper is to further explore the barriers and facilitators that influenced access to digital brain health education and resources for AD prevention and care management during the COVID-19 pandemic. Specifically, this study focuses on website usage barriers that may have contributed to the digital divide in Latino and Hispanic communities living in Los Angeles County [21]. When assessing digital health information available on websites, we considered factors that directly or indirectly impacted digital literacy.

We used the National Institutes of Aging (NIA) Health Disparities Research Framework [41] and adapted Bronfenbrenner's Social Ecological Model [34] to guide our work. Our conceptual model (Figure 1) highlights the possible social determinants of health at the environmental and sociocultural levels that impact digital literacy among Latino and Hispanic AD patients and their caregivers living in Los Angeles County.

At the environmental level, determinants such as geographical and political factors—including documentation status and the criminalization of immigrants—play a significant role in shaping healthcare accessibility [42]. For example, undocumented Latinos may be reluctant to seek healthcare due to fears of deportation or legal repercussions, which can prevent them from accessing digital resources or even learning about available AD services. Socioeconomic factors like income and occupation also contribute, as lower-income families may lack the financial resources to afford internet access or digital devices, further widening the digital divide. Additionally, healthcare factors such as access to insurance and the availability of Latino and Latina medical providers can either facilitate or hinder the ability to obtain and use digital health resources effectively [43,44].

At the sociocultural level, *familismo* [45] and illness narratives [46] play a vital role in family-

centered decision-making dynamics, which include traditions, religion, values, and norms that are part of the NIA's framework for sociocultural determinants of health [41]. In Latino and Hispanic communities, for instance, illness narratives often use terms like "loquera" (craziness) to describe mental illness, including dementia. This language not only reflects cultural perceptions but also ties into the broader issue of structural stigma against people with mental or cognitive impairments. Such stigma can create barriers to care, perpetuate negative stereotypes, and reinforce social inequities. The use of terms like "loquera" can contribute to this stigma, framing mental health conditions in a dismissive way that may discourage individuals and families from seeking help or accessing appropriate care [47]. Combined, these environmental and sociocultural factors potentially contributed to the uptake of digital health information and help-seeking behaviors for e-health AD resources and services during the COVID-19 pandemic.
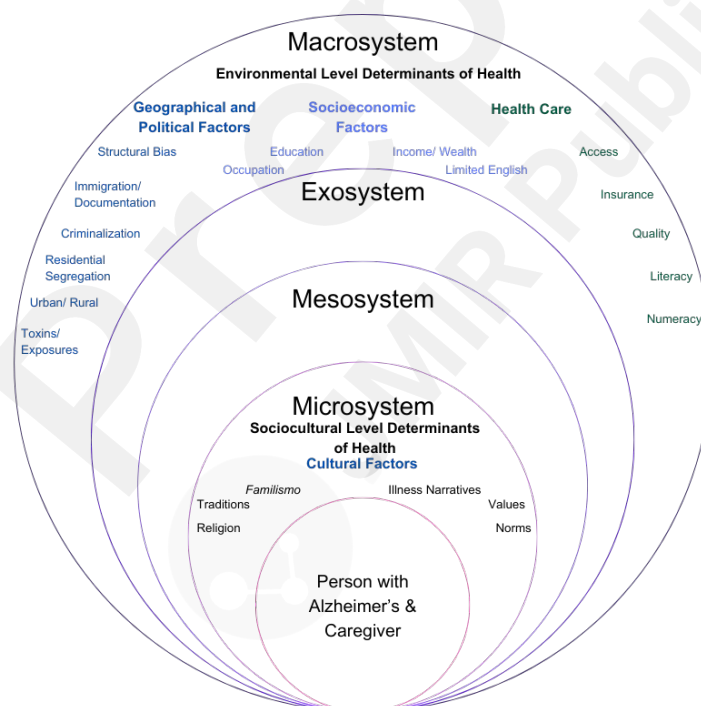

Methods

Digital Literacy Model Development

Using UCLA Library Search, which provides access to dozens of external databases, we conducted a

literature review of studies, spanning from 2000 to current, that have assessed the role of the digital divide in driving health accessibility disparities among ethnic minorities to identify repeated digital accessibility barriers and facilitators. Search keywords included: COVID-19, digital divide, eHealth, online health information, digital access, Latinos, Hispanics, marginalized communities, and health equity. This search endeavor identified nearly 40 relevant articles in which access to quality internet, familiarity with technology use, disabilities/cognitive impairment, educational attainment, age, and language [21,26,30,31,38,48-50] were the main factors elucidated as contributing to a web user's overall digital literacy, the ability to find, evaluate, and engage with health information online [23]. Our team found that a model that comprehensively conceptualizes these themes in relation to encompassing digital literacy does not exist. In response, we developed the Digital Literacy model to help us investigate why Latinos and Hispanics in Los Angeles County do not often engage with AD services and resources online (Figure 2).
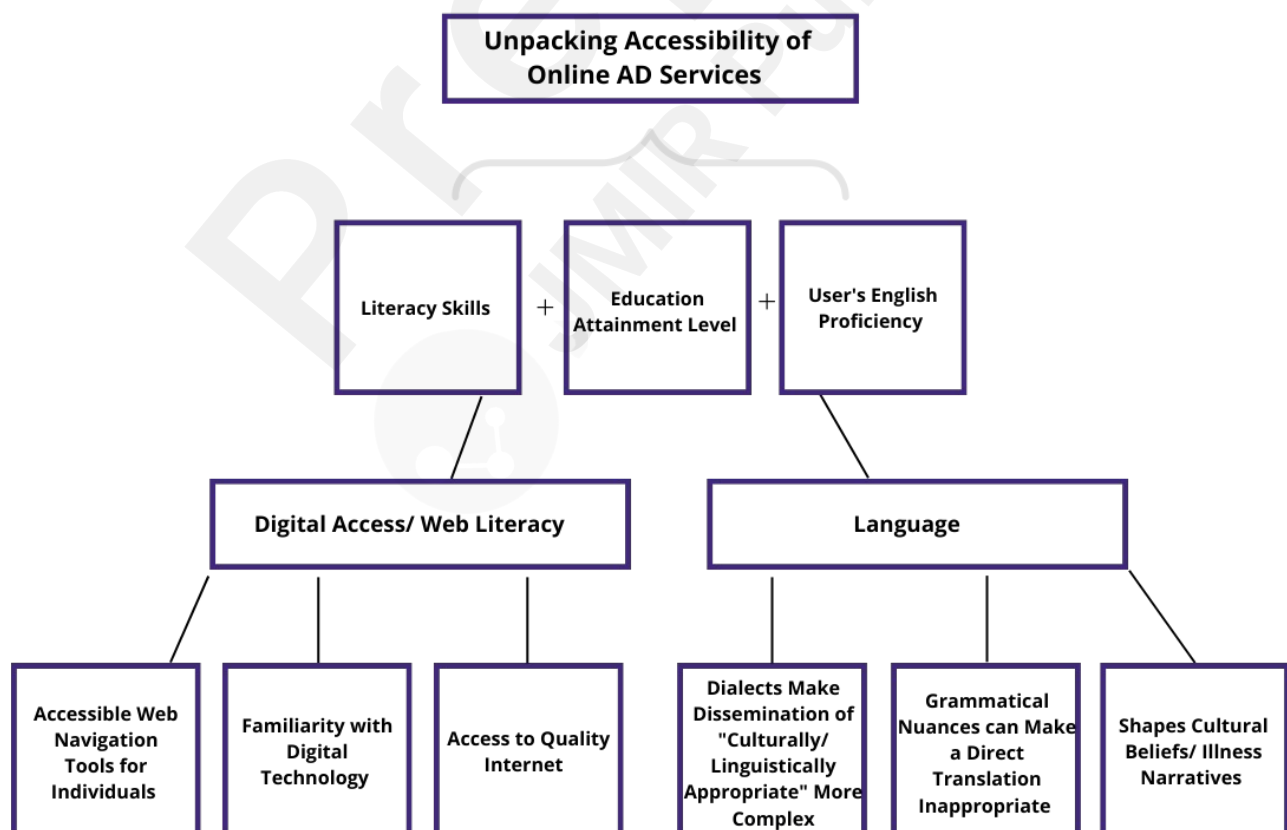
Our bivariate model conceptually links the relationship between a user's digital reach (Digital Access/Web Literacy) and preferred language as modifiable factors that can facilitate accessibility of online AD services and resources. Furthermore, it also helps refine a focus on environmental determinants of health at the geographical, political, and social levels [41]. It identifies two primary factors, (1) Digital Access/Web Literacy and (2) Language, to better understand potential drivers influencing a user's experience in accessing online AD services and resources. Digital Access/Web Literacy are contingent on a user's need or preference for Accessible Web Navigation Tools, their own familiarity with Digital Technology, and their Access to Quality Internet. Similarly, a user's web navigation experience is shaped by their preferred Language and the depth to which the complexities of its written dissemination are embedded and considered. That is, Dialects Make Dissemination of "Culturally/Linguistically Appropriate" content More Complex. Grammatical Nuances can Make a Direct Translation Inappropriate. Language itself Shapes Cultural Beliefs/Illness Narratives. Altogether, the extent to which the two primary factors will shape the outcome of a user's web navigation experience is dependent on the individual's Literacy Skills, Education Attainment Levels, and User's English Proficiency. We implemented our conceptual model when evaluating websites that offer AD educational resources and community services for Los Angeles County's constituents, who speak English and Spanish.

Digital Search Process

Between January and February 2022, we conducted a Google search using a combination of words (including the Spanish counterpart) and terms to explore community organizations that offer AD prevention, early detection and management resources and services in Los Angeles County. Key words included: Alzheimer's and Related Dementias (Alzheimer y Demencias Relacionadas), Alzheimer's (Alzheimer), dementia/s (demencia/s), elder adult services (servicios para adultos

mayores), healthy aging (envejecimiento sano), aging services (servicios de envejecimiento), social

services (servicios sociales), human services (recursos humanos), seniors (ancianos), community

resources (recursos comunitarios), Los Angeles, Los Angeles County (condado de Los Ángeles). We

identified 89 organizations with associated digital websites.

Selection Criteria/ Study Selection

Our study's objective was to assess the accessibility of AD prevention, early detection, and

management resources and services in Los Angeles County. Inclusion criteria included, locally

established organizations providing AD educational information through in-person community

events or online webinars, caregiving support (e.g., adult day care, family resources, referral

services, support groups, social services support, or meal support), or resources for professionals,

with all information available on the official website. Out of 89 resulting websites in the initial

search, fifteen entities met these criteria. Figure 3 outlines our selection screening process for the

qualitative review of websites' content.
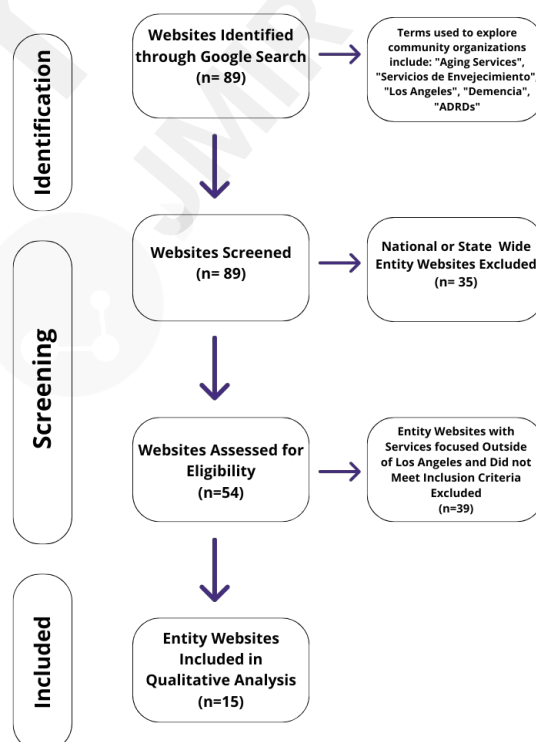
We excluded 21 state-level organizations identified in the initial search as they were not within Los Angeles County and provided services beyond direct healthy aging or AD-related services. For instance, four were focused on planning healthy aging improvement task forces, such as the California Task Force on Alzheimer's Prevention & Preparedness and the California Master Plan on Aging. While they are crucial state-led initiatives, they offered no immediate aid to families navigating an AD diagnosis. An additional 14 national-level entities were also excluded, as their resources and services were not exclusively tailored to Latino and Hispanic constituents of Los Angeles County. This group included the National Institute of Aging and The National Hospice and Palliative Care Organization, two other federally funded education and research organizations, four caregiver aide service locators, and six financial-education and training support organizations for caregivers. A total of 35 California state and national-wide organizations were excluded as they did not offer specific support services outlined in the inclusion criteria. Out of the remaining 54 organizations' websites, 39 were excluded for providing services related to our inclusion criteria outside of Los Angeles County. Fifteen websites met our inclusion criteria.

Procedures

We assessed the 15 websites following our Digital Literacy Model (Figure 2). All 15 websites were evaluated by: web accessibility tools, the type and number of services/resources available in Spanish (in addition to English), linguistic and cultural barriers, and the inclusion of family dialogue resources.

To assess the presence of sufficient web accessibility tools, our team accounted for the inclusion of user-friendly navigation and adjustment tools such as screen reader compatibility, available color adjustment tools, text adjustment tools, and other measures aimed at improving web accessibility to those protected under the American Disability Act (ADA) [51]. Past research suggests such features can help ensure that Latinos and Hispanics in Los Angeles with cognitive

impairments, often co-morbid with other disabilities, can access vital information with reasonable accommodations [52].

The type and number of services/resources available in Spanish (in addition to those offered in English) were defined as critical indicators of linguistic inclusivity and cultural responsiveness within the scope of this study. For example, for every resource listed on a particular web page (e.g., written informational discourse or a listed caregiver support group), was there a Spanish version available? If the answer was yes, we also assessed whether Google Translation software was implemented to increase language accessibility, whether other translation tools were used, or whether the information existed on a linked page exclusively written in Spanish. We leveraged the research team's familiarity with colloquial Spanish from Mexico, Central America, South American and Latin America to evaluate potential linguistic and cultural barriers embedded in the written discourse of online health information. Recognizing that words and the ways they are conveyed carry specific cultural influences, particularly within Latino and Hispanic communities, we delved into the concept of illness narratives which play a significant role in shaping and molding the experience of illness for individuals and their families [46]. Understanding the nuances of these narratives is crucial, especially in the context of AD, where describing the disease's prognosis implications and offering support must be approached in a culturally informed and competent manner (6,53). For example, as we explored the websites' content, we assessed what were some word choices used around the depiction of AD: enfermedad vs. mal (sickness vs. bad condition) or demencia vs. discapacidad cognitiva (dementia vs cognitive impairment). Furthermore, we also informally assessed for formal Spanish at or above primary grade level vocabulary, as a literacy barrier for community members with low levels of education attainment [19].

We also assessed for availability of family dialogue/support services or resources. The role of *familismo,* family-centered decision-making and multigenerational roles in Latino and Hispanic

households, [45,53], is an important tool to assist families and extended communities in preventing, detecting, and managing navigate the AD care systems.

In addition to the online assessment, we conducted direct inquiries by calling six organizations identified on the websites. These calls aimed to further assess the status of the programs listed on the websites. Specifically, we inquired about the currency of the information, seeking confirmation that the programs and services were still active and relevant. Moreover, we sought insights into the organizations' plans for future programming, especially those originally available only in English, to determine if there were considerations for making these resources accessible in Spanish soon. This phone-based inquiry allowed us to gather real-time information and insights directly from the organizations, providing a comprehensive understanding of the current and potential linguistic inclusivity of the resources offered. We chose six out of the 15 organizations due to an existing partnership or expressed interest in forming one.

Data Analysis

Questions asked per site to assess equity and accessibility included, (See Table 1):

Research Question (RQ) 1: Is there a web accessibility tool featured on the site's home page? Is this embedded into the website (e.g., font adapter) or is it facilitated through a third party entity (e.g., UserWay.org [54])?

RQ2: Is the entire site available in Spanish or is information in Spanish found under specific tabs (e.g., "En Español")? Are all services and resources offered in English also available in Spanish?

RQ3: Is the information presented in Spanish conveyed in the most accessible and culturally congruent language?

RQ4: What resources are available to help facilitate family dialogues about AD, implications for the future, and caregiving?

RQ5: Are there additional barriers in website navigation and access to available e-health AD resources?

We used Microsoft Excel for the qualitative review of websites' content.

Results

Our analyses identified varying levels of web navigation accessibility tools, with 5 websites featuring tools to enhance user experience including, font size adapter, contrast adapter, text reader, and for 1 of the 5 websites, other features provided by EqualWeb software [55]. The evaluation of web navigation accessibility tools revealed a spectrum of support, with 5 out of the 15 websites featuring tools to enhance user experience.

Among the 15 websites analyzed, a subset of 4 provided content in Spanish. A closer examination of the 4 websites revealed nuances in the quality of language adaptation, with only 1 website demonstrating a comprehensive and nuanced use of Spanish. This site employed a detailed and empathetic delivery, setting it apart from others that leaned towards a more formal vocabulary and a *matter-of-fact* tone of Spanish. Additionally, some sites offered very few of their services, such as digital workshops, in Spanish, while others had an abundance listed, including tip sheets available for download in Spanish. Only 2 websites provided resources to facilitate dialogue about AD among family members.

Additional barriers to sustained digital engagement were identified (Table 1).

Criteria	Number of websites that met criteria
Web accessibility tool available	5
Website and/or services available in Spanish	4
Information in Spanish is culturally congruent	1
Resources available to facilitate family dialogues	2
Additional barriers	3

Across our assessment, three websites required an email subscription to further access services or information, potentially creating hurdles for community members who are cautious about sharing personal information online. Another barrier to sustained digital engagement, across five websites, was the encouragement to submit questions through online inquiry forms instead of dialing a direct number, thus introducing an extra layer of complexity for users seeking immediate assistance.

The first author reached out to six organizations, with which there was an existing partnership or expressed interest in forming one, directly. We found that two of the organizations, which offer a wide array of services, greeted the caller with multiple options before routing them to the desired respondent, in which the automated voice spoke only English. The other four greeted the caller with a receptionist speaking English. One person informed us she also spoke Spanish, while the other three mentioned their Spanish-speaking skills were limited, but they could understand general questions regarding the services their respective organization provides. The limited availability of Spanish speakers during phone inquiries is a notable concern for Latinos and Hispanics seeking information, as it may hinder effective communication and understanding of the range of services these organizations offer.

Discussion

Principal Results

In examining the landscape of AD resources accessible to Spanish-speaking Latinos and Hispanics living in Los Angeles County, our analysis of 15 websites has unveiled critical insights into the digital disparities faced by these communities. The limited presence of content in Spanish, with only 4 out of the 15 websites providing such content, underscores the pressing need for targeted

improvements in linguistic accessibility. Notably, the variation in language adaptation quality among these websites indicates the importance of employing a nuanced and empathetic approach in delivering information [53], as observed in the comprehensive use of Spanish by one standout website. Additionally, we found that only 5 out of 15 websites included web accessibility tools, and just 2 provided resources to support family dialogues, making these websites less user-friendly overall [45,52].

Beyond cultural and linguistic barriers, our study unveiled obstacles to sustained digital engagement. The requirement for email subscriptions on three websites and the preference for online inquiry forms on five websites may inadvertently create obstacles for community members who are cautious about sharing personal information or seeking immediate assistance. Additionally, our direct interactions with organizations brought attention to the limited availability of Spanish speakers during phone inquiries, a concern that significantly impacts effective communication and the understanding of available services. This lack of linguistically appropriate staff poses an urgent challenge [56]. Community members are often left without the resources to obtain the support they need, making it difficult to navigate AD care services and resources options. In response, there is a pressing need for community organizations and health service providers to increase their commitment to hiring and training bilingual staff to address the linguistic needs of their constituents.

Cultural and Linguistic Diversity in Los Angeles

Our study, conducted in the context of the significant and diverse Latino and Hispanic population in Los Angeles County, illuminates critical issues surrounding AD awareness and support. With nearly half of the county's population identifying as Latinos or Hispanics, comprising a mosaic of cultural backgrounds, our findings emphasize the necessity for targeted initiatives promoting

healthy aging and brain health awareness tailored to the unique needs of distinct Latino and

Hispanic subgroups. Latinos and Hispanics in Los Angeles County comprise nearly half of the total

population, totaling 4.8 million individuals [57]. This ethnic group is marked by cultural and linguistic

diversity, with 73% of the Latino and Hispanic population being of Mexican heritage, 9.6%

Salvadorian, 6.0% Guatemalan, 3.1% originating from a South American country, 1.3% Honduran,

and the remainder from Puerto Rican, Cuban, Dominican, other Central American, or other

Hispanic-Latino origins [57]. This rich diversity accentuates the necessity for promoting AD

educational resources and services tailored to these distinct Latino and Hispanic subgroups in a

culturally and linguistically competent manner.

Barriers to Digital Engagement During the Pandemic

In response to the significant shift towards digital platforms during the pandemic, which

prompted our investigation into the digital landscape, community members were notably *not*

engaging with webinars [21, 48]. While we recognize the pandemic's effect on fundamental

necessities within Latino and Hispanic communities, such as access to healthcare, food, and housing

[18, 33], our research highlights how the digital realm exacerbates existing disparities. This

circumstance led us to develop a Digital Literacy Model designed to assess the website accessibility

of organizations providing AD services in Los Angeles County. These websites play a vital role as

resources for community members grappling with an AD diagnosis, particularly amid the challenges

posed by the pandemic.

Website Accessibility and Inclusivity

Our analysis revealed multiple barriers to accessing essential AD resources through these

websites. Specifically, the website designs demonstrated limited consideration for the intricate

relationship between a user's digital competencies (Digital Access/Web Literacy) and the nuanced

complexities of virtually accommodating for preferred language as modifiable factors that can facilitate accessibility of online AD services. Moreover, the informal telephone interviews suggest that programs and website development in languages other than English (Spanish, in this case) are implemented on an as needed basis [64]. Our findings shed light on the challenges faced by the Latino and Hispanic communities in accessing vital e-health information, particularly as the shift towards digital platforms persists, magnifying AD disparities.

Limited English proficiency has been frequently highlighted as a factor that makes it difficult for users to interact with online health information [30]. Only 4 of 15 AD websites featured their information and resources in Spanish. Half of these websites utilize Google translation services, which are not conducive to rendering culturally and linguistically congruent Spanish translations. According to bloggers within the linguistics and translation communities, this is partially due to the lack of adequate translation software accounting for idiom recognition, significant context, and the chronemics or perception of time/timelines across cultures [59]. In other words, Google translations tend to offer more "direct" or literal translations, which do not fit in seamlessly with the delivery of linguistically and culturally accessible AD resources and services to the Latino and Hispanic communities. Nonetheless, navigating the website to convert the information into the preferred language with Google Translate often requires some level of English language proficiency and website navigation literacy to access the Spanish interface of a website [48].

Among the 15 websites assessed, only five included crucial navigation tools. These tools are essential for web and content accessibility, catering to individuals with visual, motor, auditory, speech, or cognitive disabilities including AD. With nearly 1 in 4 U.S. citizens having one of these disabilities and 46% of people aged 60 and older being affected, prioritizing accessibility is crucial [60]. Guidelines like the Web Content Accessibility Guidelines (WCAG) have been established to facilitate the creation of inclusive digital content, recognizing the importance of web navigation

tools to enhance accessibility [61]. Approximately one-third of the evaluated sites demonstrated proper attention to fonts, colors, language, navigation structure, and accessibility features, ensuring that Latino and Hispanic Angelenos with cognitive impairments can access vital information with reasonable accommodations [52]. Implementing accessibility software tools, such as screen readers, can significantly benefit individuals with a disability and their families seeking information on AD prevention and care.

Cultural Relevance and Familismo

Incorporating the principle of *familismo* [45,53] into our model, we recognize its pivotal role in enhancing engagement and accessibility to AD resources and services. Our exploration of the role of *familismo* stems from the acknowledgment that involving family members is not only beneficial for seeking AD information and resources but also holds broader applicability across health contexts. Previous research supports this notion, as participants in a study evaluating the acceptability and usage barriers of electronic patient portals in Los Angeles, facilitated by the Department of Health Services, expressed a clear preference for community and family-focused networks of engagement [25]. Their feedback emphasized the significance of familial involvement in efforts to augment knowledge on health topics. In essence, our findings underscore the urgent need for targeted interventions that consider the unique needs of the diverse Latino and Hispanic population in Los Angeles County. The Digital Literacy Model, with its focus on web accessibility and language considerations, provides a framework for addressing the identified barriers in future website designs. AD

As digital health information persists beyond the COVID-19 era, it is imperative to ensure that such information, particularly resources for AD prevention and care, is made equitable for Latinos and Hispanics in Los Angeles County and beyond. The role of *familismo* in information delivery is highlighted, indicating that involving family and community networks in disseminating AD

e-health information may enhance acceptability and engagement among Latinos and Hispanics in Los Angeles. Socioeconomic factors such as education, income stability, occupation, and English proficiency, along with health care factors like access, insurance, quality, and health literacy, are crucial social determinants of health that organizations are encouraged to take into account as they develop their website designs and e-health services/resources [41].

Limitations and Future Directions

Our study has several limitations. A formal assessment of linguistic and literacy levels in the Spanish content present on the websites about AD was not possible. Future studies should consider collaborating with linguists or language experts specializing in Spanish language and literacy to conduct formal assessments [62,63]. Leveraging standardized tools and methodologies for linguistic and literacy assessment, as well as utilizing software designed specifically for linguistic analysis, can enhance the reliability and validity of findings [64]. Additionally, establishing partnerships with academic linguists or language departments at universities can provide valuable insights and guidance on best practices for assessment [58]. Furthermore, the rapid nature of the pandemic-induced shift to digital platforms posed challenges to consistent assessment and monitoring of changes or updates made to website content, making a comprehensive and comparative analysis difficult. To address this, researchers could develop a systematic approach for monitoring changes over time, utilizing web scraping tools or software applications for automated monitoring [65,66]. Regular assessments at predefined intervals would allow for tracking changes in linguistic and literacy levels and identifying emerging trends. Finally, the initial assessment occurred from mid-January to late February of 2022 amid ongoing COVID-19 restrictions, preventing a reevaluation of the digital landscape in real-time under changed conditions post-pandemic. Planning for a follow-up evaluation post-pandemic would enable researchers to assess any shifts in website content and accessibility, facilitating a comparative analysis between pre-pandemic and post-pandemic data.

Despite these limitations, our study lays the groundwork for future directions in advancing digital health accessibility for Latino and Hispanic communities navigating the AD digital space. Moving forward, we aim to test the validity of the variables in our Digital Literacy Model by incorporating its concepts into the design and implementation of our research lab's own website and targeted digital social media campaign. Future research should also explore the social determinants of health that exist within the mesosystem and exosystem as represented in Bronfenbrenner's model, which was not covered in this paper. Understanding the interactions between the immediate settings of the mesosystem, such as the relationship between family and healthcare providers, and the broader social contexts of the exosystem, like community support networks and policy environments, can offer deeper insights into the systemic factors influencing digital health accessibility for Latino and Hispanic communities.

Conclusion

In conclusion, this study emphasizes the critical need to bridge the gap between organizations providing AD resources and services and the diverse Latino and Hispanic communities in Los Angeles County. Our study revealed that, despite constituting nearly half of the county's population and increased projected AD prevalence by 2040 [1], Latinos and Hispanics are likely to face significant challenges in accessing digital AD information and support services, underscoring existing health disparities in prevention, early detection, and management. By embracing innovative approaches and adapting our model to the evolving digital landscape, our objective is to bridge the information gap, enhance engagement, and contribute to developing culturally and linguistically responsive digital resources for AD prevention and care management.

Acknowledgements

Conflicts of Interest

None declared.

Abbreviations

ACA: The Affordable Care Act
AD: Alzheimer's Disease
ADA: American Disability Act
COVID-19: Coronavirus Disease 2019
NIA: National Institutes of Aging
HITEC: Health Information Technology for Economic and Clinical Health
SES: Social Economic Status

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Table 1

Overview of Questions Posed per Site to Evaluate Equity and Accessibility and Results

Criteria	Number of websites that met criteria
Web accessibility tool available	5
Website and/or services available in Spanish	4
Information in Spanish is culturally congruent	1
Resources available to facilitate family dialogues	2
Additional barriers	3

Figure 1

An adapted model, based on Bronfenbrenner's Social Ecological Model [34, 67] highlights the environmental factors impacting Latino-Hispanic Alzheimer's Disease and Related Dementias (AD) patients and their caregivers in Los Angeles County. Key elements include *familismo* and illness narratives, which influence family-centered decision-making by incorporating traditions, religion, values, and norms, consistent with sociocultural determinants of health outlined by the National Institute on Aging (NIA) [41].
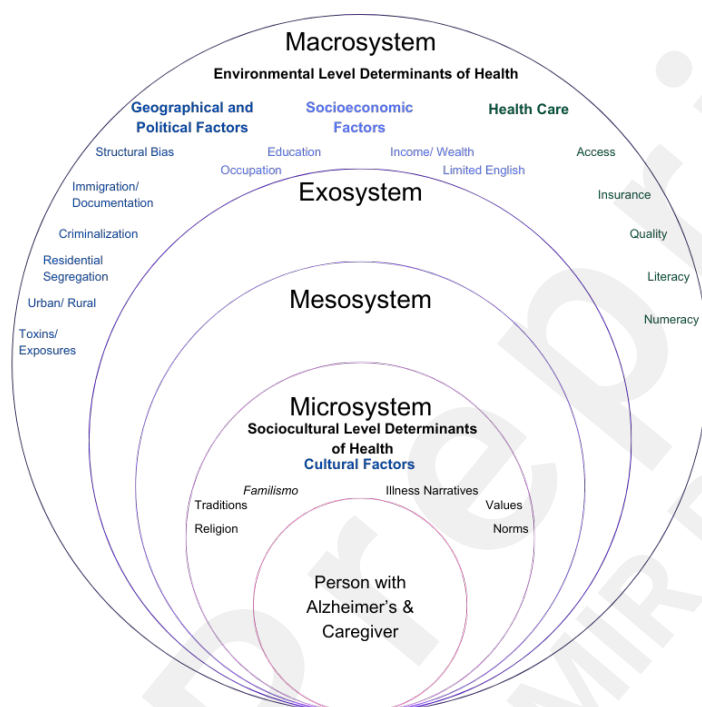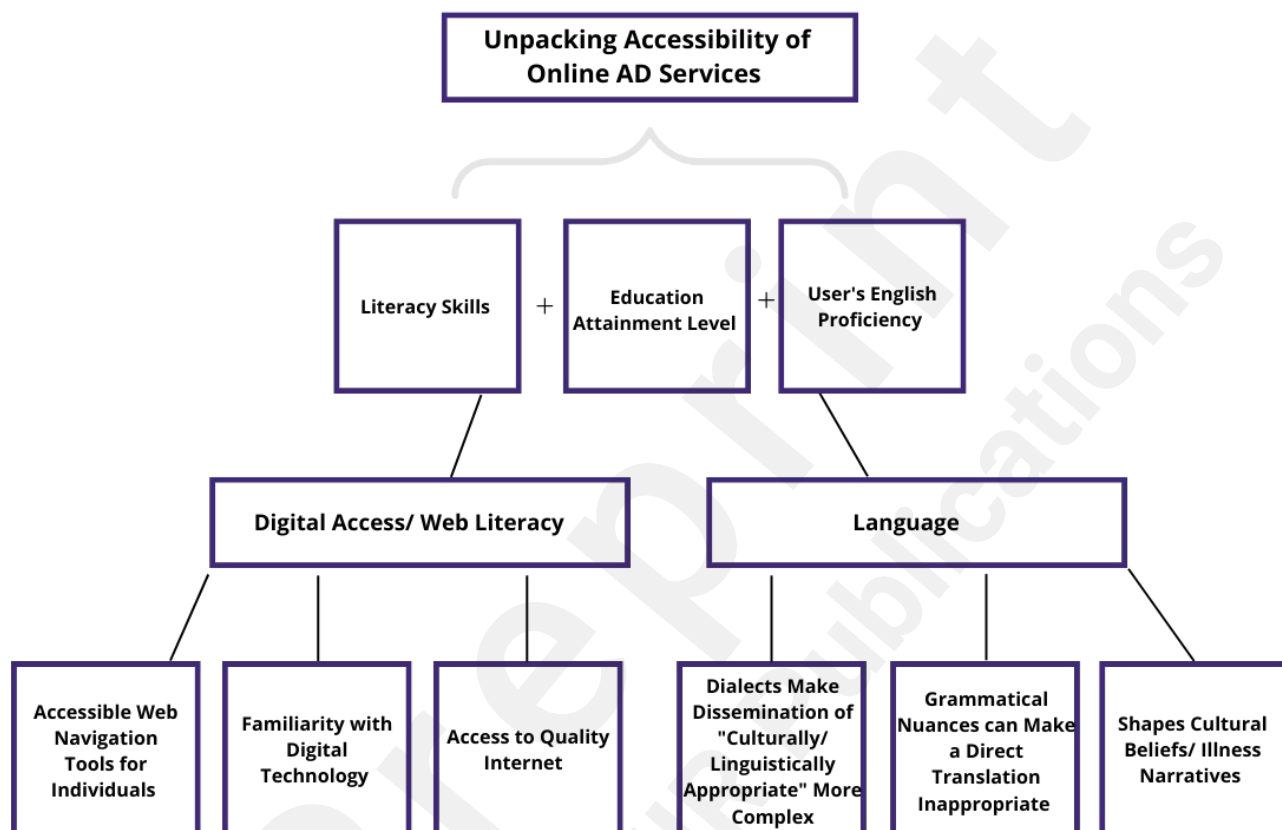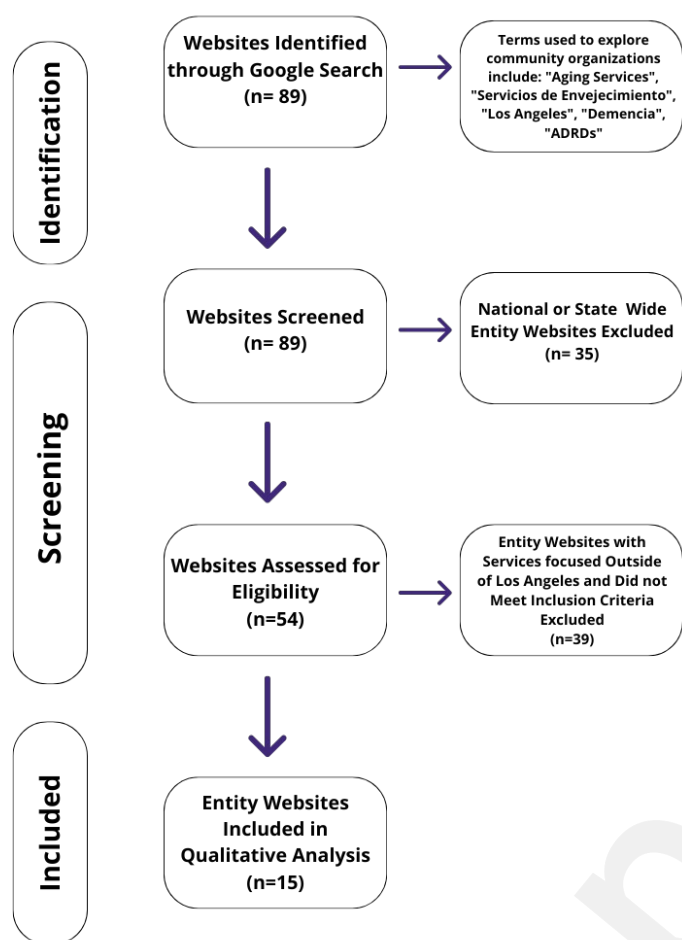
Figure 2

A bivariate conceptual model hypothesized to conceptually link the relationship between a user's digital reach (Digital Access/Web Literacy) and the nuanced complexities of virtually accommodating for preferred language as modifiable factors that can facilitate accessibility of online AD services.
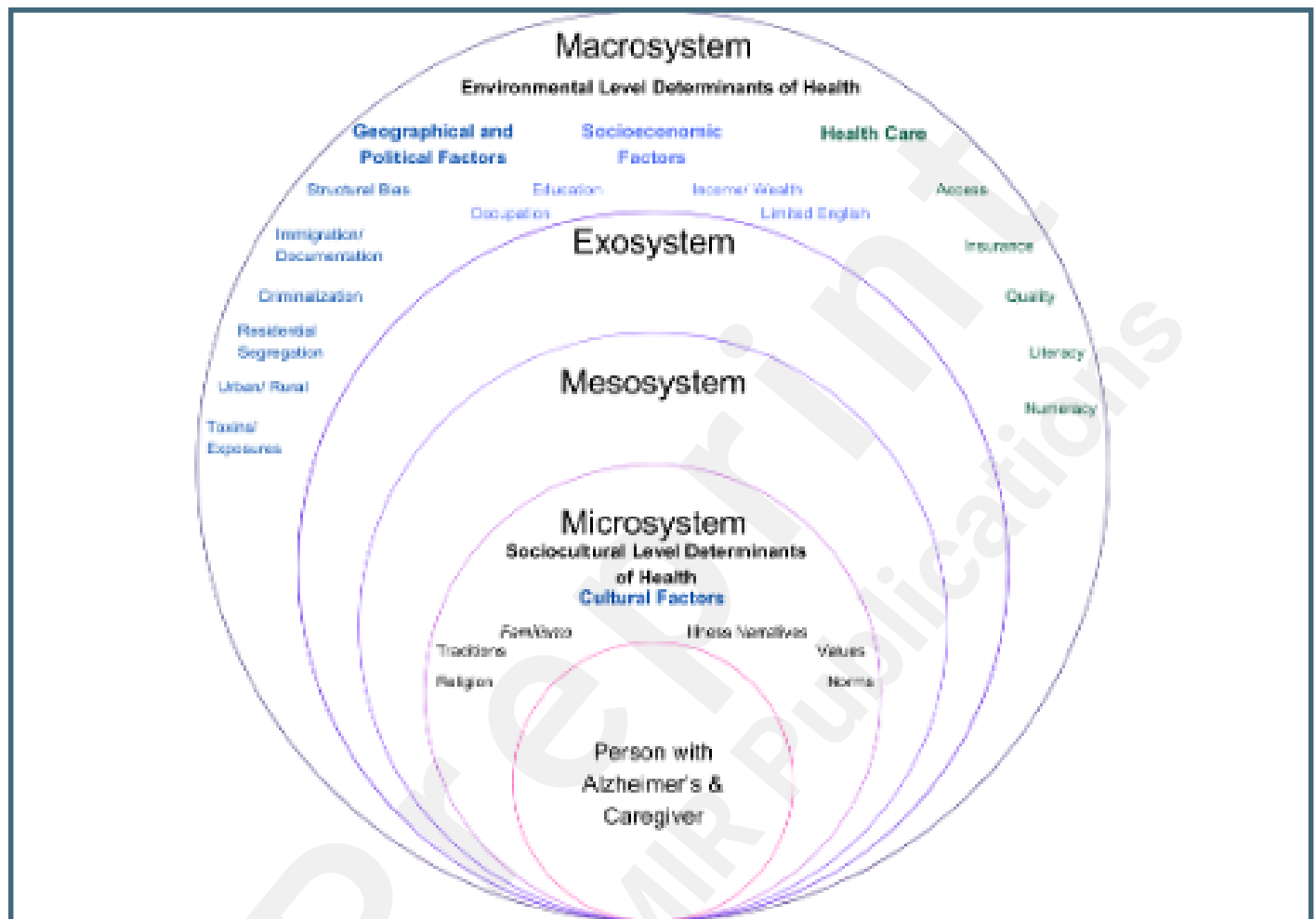

Figure 3

Flowchart of selection process for the qualitative review of websites' content.

Identification	**Websites Identified through Google Search (n= 89)** → Terms used to explore community organizations include: "Aging Services", "Servicios de Envejecimiento", "Los Angeles", "Demencia", "ADRDs"
Screening	**Websites Screened (n= 89)** → National or State Wide Entity Websites Excluded (n= 35)
	Websites Assessed for Eligibility (n=54) → Entity Websites with Services focused Outside of Los Angeles and Did not Meet Inclusion Criteria Excluded (n=39)
Included	**Entity Websites Included in Qualitative Analysis (n=15)**

# Supplementary Files

Figures

An adapted model, based on Bronfenbrenner's Social Ecological Model [34, 67] highlights the environmental factors impacting Latino-Hispanic Alzheimer's Disease and Related Dementias (AD) patients and their caregivers in Los Angeles County. Key elements include familismo and illness narratives, which influence family-centered decision-making by incorporating traditions, religion, values, and norms, consistent with sociocultural determinants of health outlined by the National Institute on Aging (NIA) [41].

A bivariate conceptual model hypothesized to conceptually link the relationship between a user's digital reach (Digital Access/Web Literacy) and the nuanced complexities of virtually accommodating for preferred language as modifiable factors that can facilitate accessibility of online AD services.
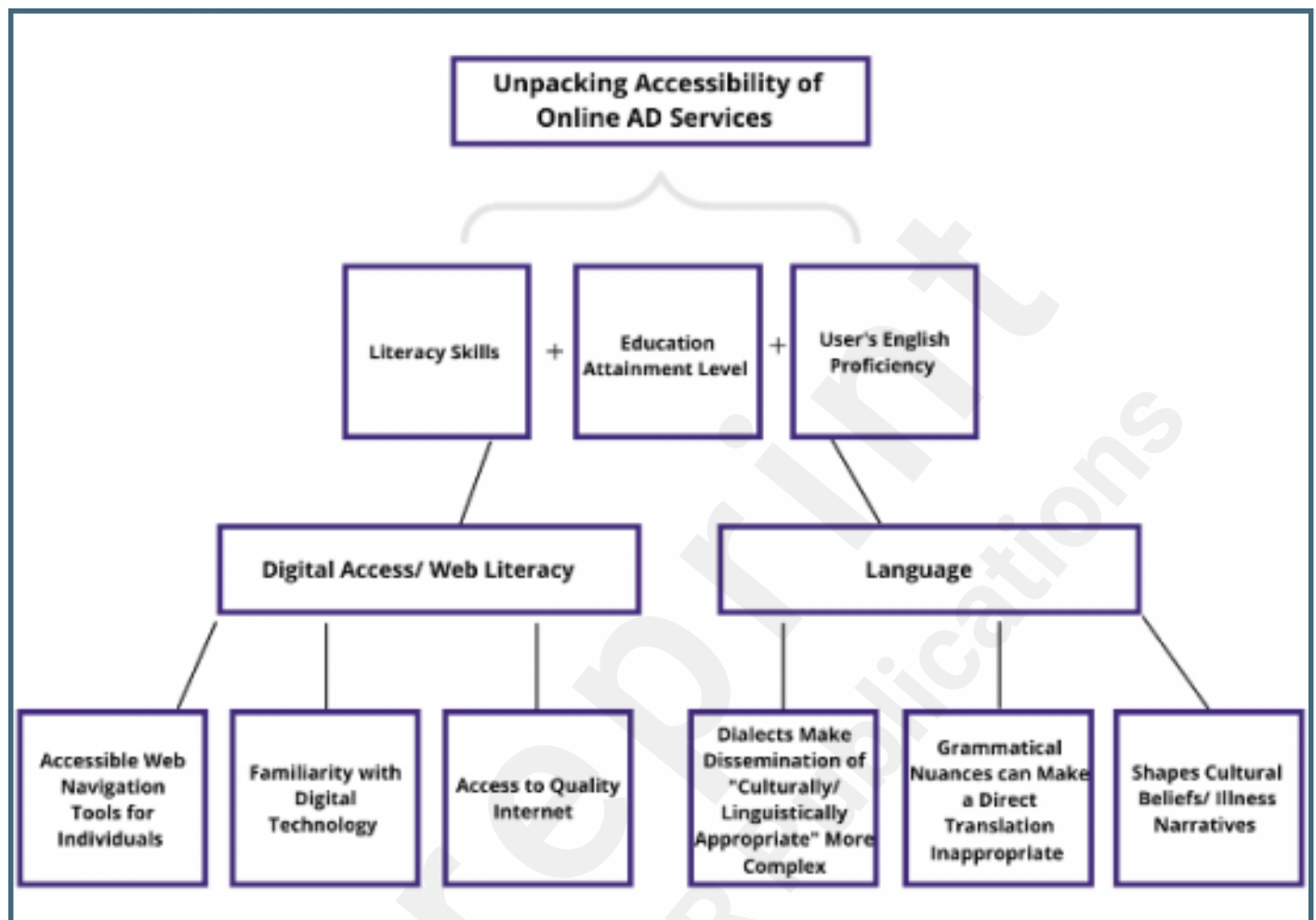
Flowchart of selection process for the qualitative review of websites' content.
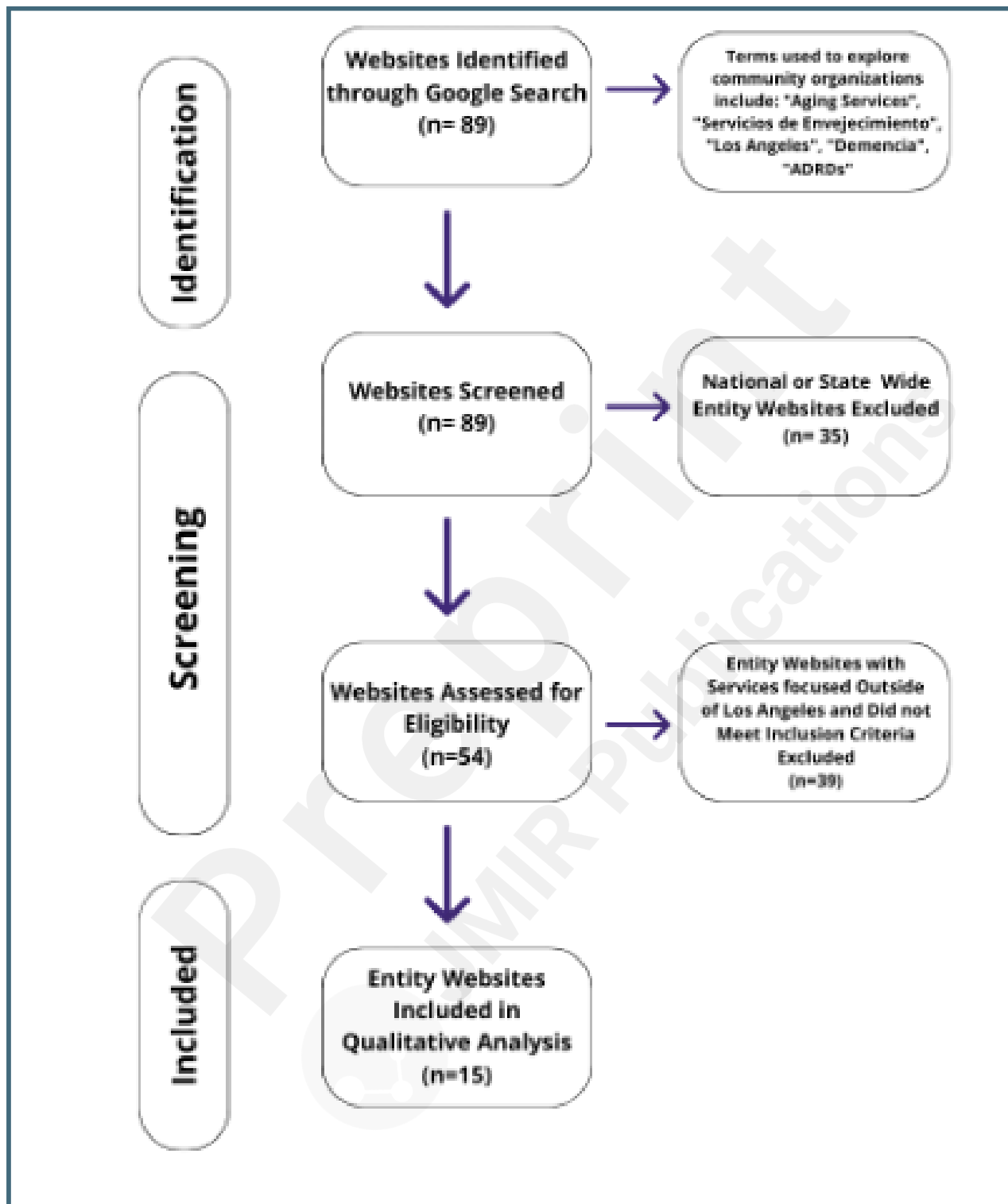
Multimedia Appendixes

Overview of Questions Posed per Site to Evaluate Equity and Accessibility and Results.
URL: http://asset.jmir.pub/assets/88d03fa58e33f1fd675af1c7aa1177e4.docx