

Designing Beyond Language: Sociotechnical Barriers in AI Health Technologies for Limited English Proficiency

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Abstract

Limited English proficiency (LEP) patients in the U.S. face systemic barriers to healthcare beyond language and interpreter access, encompassing procedural and institutional constraints. AI advances may support communication and care through on-demand translation and visit preparation, but also risk exacerbating existing inequalities. We conducted storyboard-driven interviews with 14 patient navigators to explore how AI could shape care experiences for Spanish-speaking LEP individuals. We identified tensions around linguistic and cultural misunderstandings, privacy concerns, and opportunities and risks for AI to augment care workflows. Participants highlighted structural factors that can undermine trust in AI systems, including sensitive information disclosure, unstable technology access, and low digital literacy. While AI tools can potentially alleviate social barriers and institutional constraints, there are risks of misinformation and uprooting human camaraderie. Our findings contribute design considerations for AI that support LEP patients and care teams via rapport-building, education and language support, and minimizing disruptions to existing practices.

CCS Concepts

- Human-centered computing → HCI design and evaluation methods; Natural language interfaces.

Keywords

healthcare, limited English proficiency (LEP), Artificial Intelligence (AI), storyboards, interviews, patient navigators

1 Introduction

Patient-provider communication is strongly linked to health outcomes and quality of care [13, 84, 106]. Effective communication builds therapeutic relationships, satisfaction, trust, and long-term health outcomes [45, 106], while poor communication contributes to errors, compromised patient safety, and inefficient use of resources [109, 112]. Language barriers in particular can exacerbate these challenges. In the U.S., over 25 million individuals aged 5 years and older report speaking English less than “very well” [111]. These individuals with limited English proficiency (LEP) are more likely

to experience misdiagnoses, medication complications, poorer adherence to treatment plans, and decreased comprehension of diagnoses [22, 37, 39, 109]. Consequently, patient-provider communication, relationship-building, and shared decision-making break down [37, 87], reducing both patient and provider satisfaction [5].

Digital health technologies, such as telehealth, online patient portals, and mobile health applications, can facilitate asynchronous communication and on-demand information access, which in principle could improve the quality and convenience of healthcare by enabling continuous and accessible support [33, 34, 76]. However, LEP populations underutilize these resources due to persistent implementation barriers such as low digital and health literacy, unreliable Internet access, and ethical and privacy concerns [3, 30, 66, 76, 83, 89, 92]. Even technologies designed specifically to accommodate LEP individuals, such as multilingual patient portals, are often poorly integrated or have limited functionalities, thus discouraging use [11].

Emerging AI-powered health technologies have the potential to provide personalized and timely medical support and translation [40, 60, 79], enabling LEP patients to engage with the healthcare system more effectively. For example, on-demand AI translation can facilitate patient-provider conversations [78], and new large language model (LLM)-powered chatbots can summarize and simplify complex medical information [44] or help patients prepare for visits [75, 96]. However, most AI-powered interventions target digitally literate, English-speaking patients [58, 82], and the models underpinning these interventions generally struggle to adapt to marginalized cultural [97] and language backgrounds [16, 98]. Therefore, the rapid deployment of such AI-powered health interventions runs the risk of replicating or further exacerbating existing disparities [3].

In this paper, we seek to understand the risks and opportunities that AI health interventions pose for LEP patients, guided by the following research questions (RQs):

RQ1: How can linguistic, cultural, or sociotechnical factors shape how LEP patients perceive health technologies?

RQ2: How can AI health technologies facilitate culturally responsive, trustworthy, and effective communication and collaboration between LEP patients and healthcare teams?

To address the above RQs, we conducted 14 storyboard-centered interviews with individuals who support Spanish-speaking LEP individuals receiving care in the U.S. These individuals, whom we

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collectively refer to as *patient navigators*, assisted patients in various ways, including accompanying them to provider visits, translating, teaching digital skills, and bridging resources. Their role as mediators between patients and providers lends them insights into the broader contexts and relational dynamics that shape LEP patient experiences. Consequently, they can build on their experiences to reason about the feasibility and risks of developing AI technologies to facilitate equitable communication and care.

From these interviews, we identified key communication and systemic challenges that Spanish-speaking LEP patients face, including low literacy and privacy concerns. These challenges also highlighted possible risks and opportunities for using AI, such as reducing social barriers to care while potentially diminishing existing human support. Our findings highlight the importance of adapting to cultural and linguistic nuances, overcoming various types of literacy barriers, and respecting user privacy to foster trust. These findings inform practical guidelines for developing AI tools that support LEP populations. Our contributions are summarized as follows:

- First, we illuminate cultural, communication, and structural challenges faced by Spanish-speaking LEP patients, their providers, and patient navigators.
- Second, we identify both perceived risks and opportunities for AI to support patient experiences.
- Third, we propose design guidelines and opportunities for AI tools that support patient access to healthcare resources and mediate culturally sensitive interactions.

Together, these contributions aim to inform when to—and when not to—develop AI health interventions and how to do so in a way that is attuned to the needs of linguistically and culturally diverse patient populations.

2 Related Work

2.1 Mediating Clinical Communication with LEP Individuals

Effective healthcare requires two-way communication, where providers contribute medical expertise and patients share their needs and preferences, to collaboratively develop optimal care plans [54, 117]. Strong interpersonal communication has been shown to influence patient outcomes as much as, if not more than, clinical instruction [14], leading to improved adherence to treatment plans [106], understanding of diagnoses [65], and satisfaction [95]. Conversely, impeded communication is linked to more errors [109], worsened decision-making [87], and lower rates of physician visits and preventive services [35, 55, 118]. For LEP individuals, these challenges are compounded by linguistic [99], cultural [69], intersectional [88], and procedural [38] barriers. Therefore, there is a growing interest in improving health outcomes by studying communication strategies that integrate patients' lived experiences and values [100].

Research shows that language-concordant care, whether via direct communication [80] or interpretation [29, 32], leads to fewer communication errors [62] and higher satisfaction and perceived quality of care [26] for LEP individuals. Despite these benefits, interpretation services remain underutilized due to barriers such as limited availability, cost, time constraints, and policies [56, 57, 67].

Beyond linguistic access, broader sociocultural factors complicate LEP communication. Patients may self-censor due to stigma, fear of judgment, or mistrust of institutions [31, 71]. These dynamics highlight the need for cultural sensitivity, empathy, and attention to the broader contexts of patients' lives.

2.2 AI Tools in Healthcare

Recent AI advancements have potential to support healthcare systems by improving clinical decision-making and workflows, resource allocations, medical imaging, patient monitoring, medical translations, and patient-provider relationships [15, 68, 77, 102]. However, prior work has also identified key challenges and risks when implementing AI for healthcare, including data privacy, lack of transparency in decision-making, misinformation, bias mitigation, and cultural sensitivity [20, 21, 41, 52, 77].

In particular, AI has potential to support marginalized communities in receiving care by overcoming language barriers, providing personalized health information, and offering support in rural or low-resource areas [40, 63]. Barwise et al. [15] explored patient's perception of using predictive models for interpreter prioritization and Mehandru et al. [78] used physician-in-the-loop methods to improve reliance of machine translation in settings where no human translators were available. Other work has also explored using chatbots for pre-clinical consultations [75, 96] and helping patients read physician notes [61], discharge instructions [122], and medical information [44]. While AI presents many exciting possibilities to support patient care, the majority of such interventions are focused on English or translating into English, posing issues for low-resource languages such as reinforcing biases and overlooking cultural and infrastructural challenges may cause AI to exacerbate rather than alleviate inequities in underserved populations [53, 115, 121]. The LLMs driving much of current AI developments are known to encode many societal biases, including on race [47, 98], gender [27], language [7], and culture [97]. While these challenges and biases are known, there is work needed to determine if and how AI can be designed for LEP communities while taking into consideration current model limitations and existing healthcare support systems.

2.3 Considerations for Health Technologies in Marginalized Communities

While digital health technologies generally expand access to care [6, 91], they are often underutilized by LEP patients [42, 49, 83], thus exacerbating existing inequalities [73, 120]. For example, during and after the COVID-19 pandemic, LEP patients utilized video visits and online patient portals at a lower rate than English-proficient patients [94].

Several structural factors impede health technology access for LEP individuals. Limited reading, digital, and health literacy can restrict meaningful engagement with digital tools such as patient portals [69, 105]. LEP populations face generally lower rates of access to technology [46], but even when access is available, they report distrust in digital services and difficulty understanding privacy policies [107], fueling their hesitation in adopting technology that solicits their personal information. Recent legal actions and policies in the U.S. have compounded these concerns [36, 86], underscoring the need to prioritize privacy and trust in equitable technology

design. There are, however, community-based health service approaches that have proven to be accessible and productive for LEP individuals. SMS programs, WhatsApp groups, and community health worker (CHW)-linked tools are used by Latino immigrant communities and have been shown to support self-management and information access [4, 10].

In consideration of the barriers, benefits, and risks for technology to support LEP individuals in healthcare, it is important to understand how these technologies can be implemented effectively and safely. There is little recent work that explores all of these factors together for LEP populations in particular. Accordingly, we report our findings around the barriers and experiences that LEP individuals may face when receiving healthcare, and in what ways AI technology can be designed to facilitate communication with their healthcare teams.

3 Methods

3.1 Study Context

In this study, we interviewed patient navigators who support Spanish-speaking LEP individuals when interacting with healthcare systems in the U.S. We focused on patient navigators, rather than patients themselves, because as we reflected on the tensions involved in conducting research with a marginalized community (in this case, LEP individuals seeking care), we were concerned that starting with LEP individuals might risk perpetrating further harm to the community by taking data and information and providing little in return [72]. Speaking directly with patients at the outset could also risk misrepresenting or excluding key aspects of their experiences if we failed to frame the right questions or if patients were hesitant to disclose sensitive information, especially since the lead researcher in the study was not themselves a part of this community (Section 3.7). In contrast, patient navigators routinely accompany many patients through the care-seeking process, providing crucial perspectives that surface both common experiences and specific instances that reveal how patients engage with healthcare and technology. Talking to navigators allowed us to gain an understanding of the culture and background of LEP individuals, identify potential avenues for giving back to the community (e.g., presenting at community events, conducting follow-up design workshops), and build relationships with these communities for further research into technologies that are sensitive to the needs and lived experiences of LEP individuals. We recognize that navigators themselves may also be part of LEP communities or other marginalized groups. Accordingly, we worked closely with three navigators to provide feedback on pilot studies and assess what value such a study might bring to navigators. We discuss future work building on our findings to bring benefits of new AI health tools to both LEP individuals and patient navigators (Section 5).

Initial feedback from navigators was that LEP individuals vary widely in their experience of seeking care due to their range of languages, backgrounds, and cultures. In response to this feedback, we focused on Spanish-speaking LEP individuals for two reasons: Spanish is by far the most commonly spoken language at home after English in the U.S. [111], and the majority of organizations we worked with focused primarily on Spanish speakers, giving us greater access to navigators and community resources with this

population. However, as we will further discuss in our findings (Section 4.1), even with a shared language, individuals had varying experiences and identities (e.g., be immigrants from various countries or U.S.-born). In the rest of this paper, we may refer to Spanish-speaking LEP individuals as just *LEP individuals*, for simplicity.

3.2 Study Design

3.2.1 Interest survey. Interested patient navigators completed an online screening survey that asked for demographic information, including age range, gender, ethnicity, occupation, organization, years of relevant experience in their roles, and languages spoken. We also adapted a 5-question basic AI literacy questionnaire [43] in the interest form (see Section A.1). After completing the survey questions, participants signed up for a 60-minute interview within the next week. A copy of the consent form was included for the participants to review and sign before the interview.

3.2.2 Storyboard interviews. We conducted 60-minute semi-structured storyboard interviews over Zoom with patient navigators who filled out the survey. All interviews were conducted in English. Participants were compensated with a \$20 Amazon gift card at the completion of the study. This study was approved by our organization's Institutional Review Board.

Each interview began with asking about the navigator's background, job responsibilities, and the characteristics of the patients they typically supported. We also asked about challenges they face in their role and challenges their patients face in order to identify pain points in current practices and relationships between Spanish-speaking LEP patients, navigators, and providers as opportunities for AI intervention. We then extended these discussions to consider possible outcomes of integrating AI tools in patient care.

Participants exhibited a range of knowledge on AI and ways in which they interacted with LEP individuals. To establish common ground across participants [23], we structured our interviews around six pre-defined storyboards. Storyboards can solicit immediate reactions and underlying needs probed by the hypothetical scenarios depicted [23, 48, 64]. The storyboards surfaced participants' reactions and concerns towards potential AI systems, use cases, and patient responses that they might not otherwise think of. We explored the use of AI systems in various stages of care (e.g. before, during, and after provider visits) and in various capacities (e.g. translating, explaining, comforting). For each storyboard, we aimed to uncover in-depth understandings behind participants' initial reactions.

For each interview, we screen-shared a slide deck with images of the storyboards. Participants were informed that the goal of the study was to understand their experiences with patients as a patient navigator and their perceptions of potential AI technologies. Storyboards were randomly ordered for each participant to control for potential bias introduced by ordering effects. For each storyboard, we asked if the storyboard was relatable to them and what their immediate reactions were. Then, follow-up questions were asked based on their responses or drawn from a semi-structured interview guide (available in the supplementary materials) as needed. Follow-up questions included: *What are challenges that patients face during provider visits? How do patients generally seek medical*

Table 1: Storyboard themes with motivating questions and supporting literature.

Dimension	Motivating Ideas	Relevant Literature
Language & Communication	Can AI support accurate and productive conversations? Can AI capture cultural and semantic nuances?	[7], [12], [40], [44], [61], [75], [78], [122]
Relationality & Comfort	Can patients interact with AI comfortably? Can AI cater to the patient's specific needs and background?	[16], [47], [75], [103], [119]
Clinical Safety & Accuracy	Can AI give accurate, safe, and appropriate medical information? Are AI outputs biased or culturally insensitive?	[1], [47], [59], [78], [96], [97], [98], [113], [122]
Fairness, Equity, & Access	Does AI assume certain user privileges or characteristics? Can AI worsen disparities?	[42], [46], [53], [63], [69], [73], [115], [121]
Clinical Integration & Support	Can AI enhance clinical productivity? How can AI support clinical staff safely and effectively?	[1], [12], [96], [101], [108], [114]
Privacy, Transparency, & Ethics	Do patients understand how their data will be handled? Can AI alleviate or aggravate institutional issues or policies?	[36], [41], [77], [86], [107]

information? How often do patients consider data privacy, whether online or offline?

3.3 Storyboard Construction

Following prior health-focused studies in HCI [64, 123], we constructed the storyboards using an iterative method drawing from existing literature and our research team's expertise (Section 3.7). We collected and read 34 papers across HCI, AI, and medical journals that propose use cases, risks, and benefits of AI in healthcare and for LEP individuals in particular. A clinical psychologist and expert in health equity for under-served populations, in particular Spanish-speaking communities, reviewed proposed storyboards to ensure they were comprehensive, realistic, and would elicit meaningful discussions. We consolidated storyboards in six dimensions covering possible applications of AI health technologies for LEP patients (see Table 1). These dimensions included AI performance (linguistic nuances and reliability of information), ease of use (for patients and within clinic workflows), and systemic factors (access to technology and ethical concerns). Each dimension was used to create a 4-panel storyboard scenario that followed the same general structure: 1) patient encounters a challenge, 2) AI tool is introduced as a potential solution, 3) effects (either positive or negative) of AI emerge, and 4) patient reflects on the AI interaction. We strove to depict realistic AI based current commercial or prototype systems (e.g. translation systems, chatbots). We intended for the scenarios to have a mix of positive and negative outcomes to encourage participants to consider the tensions between the benefits and risks of AI for LEP patient care. Two example storyboards are shown in Figure 1, and all storyboards can be found in Section A.2. A version of each storyboard with English translations was available for participants with limited Spanish proficiency.

3.4 Recruitment

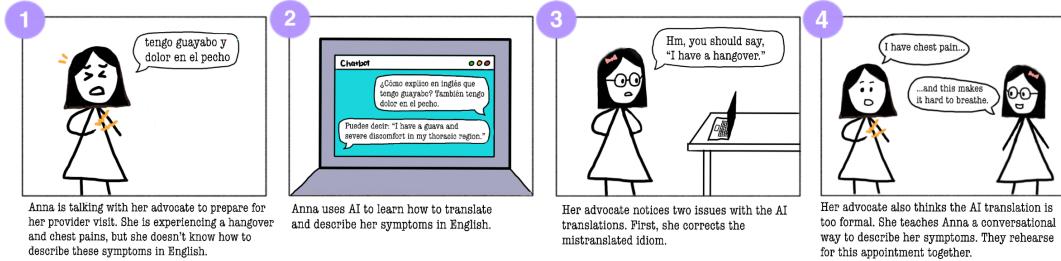
We initially recruited navigators from two community non-profits that one of our research team members had prior connections with. We drafted the recruiting email and flyer that the point of contact at each organization distributed to their staff and organizational networks for voluntary sign-ups. These flyers and emails contained a link to the interest survey (Section 3.2.1).

With the intention of gaining a holistic understanding of navigator and patient experiences, we aimed to interview patient navigators who worked across a diverse set of roles (e.g. interpretation, digital literacy, case management) and Spanish-speaking communities (e.g. children vs. adults, immigrants vs. U.S.-born, literate vs. illiterate). With this in mind, we also cold-emailed several other organizations in the region that provided health-adjacent services to Spanish-speaking populations. Eligibility criteria for scheduling an interview included being willing to participate in an interview, being able to communicate in English, and having experience directly interacting with Spanish-speaking patients in some capacity. We conducted interviews until data saturation was reached and no new information was collected (Section 3.6).

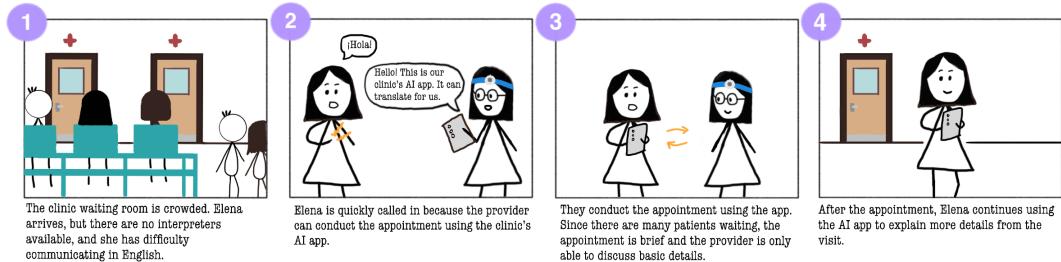
3.5 Participants

We recruited 14 patient navigators (8 female, 6 male) who supported Spanish-speaking LEP patients in the U.S. Participant roles included patient advocates, health liaisons, caseworkers, medical students, and interpreters. Participants came from eight distinct organizations, including medical schools, local community nonprofits, and public school districts. These organizations represented diverse medical care practices and resources. For example, some organizations allowed the use of ad hoc interpreters, while others required strictly professional interpreters. Some clinics had access to interpreters for low-resource languages like Q'anjob'al, while other clinics struggled to access even common languages like Spanish. Although we did not intentionally recruit patient navigators with similar cultural backgrounds as Spanish-speaking LEP individuals, 12 out of 14 participants reported speaking English and Spanish as their primary languages and having strong ties to the communities as first- or second-generation immigrants. See Table 2 for a full breakdown of participants' demographics and roles.

Though not a requirement to participate in the study, participants also exhibited fairly high degrees of familiarity and proficiency with AI technologies. Participants reported understanding basic AI concepts ($M = 3.86, SD = 0.86$) and being able to judge the benefits and risks of AI ($M = 3.64, SD = 0.74$). All participants had extensive experience using AI tools such as ChatGPT or Google Translate in their work.



(a) Language & Communication theme: AI mistranslations of idioms and medical jargon showcase potential shortcomings.



(b) Clinical Integration & Support theme: AI translator can support patient care when clinics are understaffed.

Figure 1: Example storyboards used in our interviews.

Table 2: Summary of participants, including Occupation, Age, Sex, Race, Languages Spoken, and Years Working with Spanish-Speaking Patients (Yrs. w/ SSP).

ID	Occupation	Age	Sex	Ethnicity/Race	Languages Spoken	Yrs. w/ SSP
P1	Health Program Coordinator	25-34	Female	Hispanic/Latinx	English, Spanish	1-3 years
P2	Patient Advocate	18-24	Female	Hispanic/Latinx	English, Spanish	3-5 years
P3	Caseworker	35-44	Male	Black/African American	English, Spanish, French	<1 year
P4	Community Worker	18-24	Female	Black/African American	English, French, Lingala, Swahili	<1 year
P5	Community Navigator Volunteer	25-34	Female	Hispanic/Latinx	English, Spanish	5-10 years
P6	Home Visitor	45-54	Female	White	English, Spanish	15+ years
P7	Parent Liaison	25-34	Male	Hispanic/Latinx	English, Spanish	<1 years
P8	Community Health Worker	35-44	Male	Hispanic/Latinx	English, Spanish	15+ years
P9	Medical Student	35-44	Male	Hispanic/Latinx	English, Spanish	3-5 years
P10	Latino Family Liaison	55-64	Female	Hispanic/Latinx	English, Spanish	15+ years
P11	Medical Student	18-24	Male	Hispanic/Latinx & White	English, Spanish	3-5 years
P12	Digital Literacy Program Coordinator	18-24	Female	Hispanic/Latinx	English, Spanish	1-3 years
P13	Social Worker	45-54	Female	Hispanic/Latinx	English, Spanish	15+ years
P14	Digital Literacy Program Coordinator	18-24	Male	Hispanic/Latinx	English, Spanish	1-3 years

3.6 Data Collection & Analysis

All interviews were conducted, recorded, and transcribed via Zoom. One author reviewed each transcript for accuracy, removed pauses and filler words, and paraphrased quotations cited in this paper. We followed Braun and Clark's reflexive thematic analysis approach [18, 19]. To familiarize ourselves with the data, two authors coded a subset of the interview transcripts independently. Each researcher identified quotes that were associated with our research questions and grouped these quotes with short descriptions. The two authors met to share initial ideas of interest and quotes, prompting a discussion of emerging trends that developed further into preliminary themes. These discussion included the rest of the research team in weekly and ad-hoc group meetings over the course of two weeks. The first author then reviewed the themes against the coded transcripts to ensure they were representative of the original codes.

Following this consistency check, the first author coded the remaining interview transcripts.

Given the sensitive nature of the study, we anonymized participant responses, and removed personally identifiable information during transcript review and analysis. All quotes we report have been paraphrased.

3.7 Positionality Statement

Our research team is based in the U.S. and comprises researchers holding many identities. We collectively have experience in HCI, digital health, AI ethics, and clinical psychology. We were cautious that our background in HCI and AI might lead us to a solutionist perspective in this study (i.e., that AI *should* be applied to overcome barriers), which we actively tried to avoid by creating storyboards rather than prototypes and focusing on potential risks of AI in

addition to opportunities. The team also includes a native Spanish-speaking clinical psychologist who has experience working with LEP populations, providing insight into the framing and content of the storyboards. Her personal connection with two community organizations aided with recruitment ([Section 3.4](#)), establishing familiarity and trust in our research team for those participants. The interviewing researcher is a second-generation immigrant with professional proficiency in Spanish, helping to establish some trust and familiarity with participants. However, as this researcher does not come from a similar cultural background as the patient navigators or Spanish-speaking LEP population, this difference may have influenced what participants chose to disclose and what the researcher picked up from participant responses.

4 Results

In this section, we cover our findings that address our two research questions. We start by highlighting how LEP individuals' access to health technologies can be impeded by linguistic ([Section 4.1](#)), cultural ([Section 4.2](#)) and digital ([Section 4.3 & 4.4](#)) divides. We then describe how patient navigators saw the possible applications ([Section 4.5](#)) and risks ([Section 4.6](#)) of AI tools for LEP individuals. In this section and the following, we use the term *clients* to refer to the Spanish-speaking LEP individuals that the patient navigators work with, reflecting the terminology most commonly used by the navigators themselves.

4.1 Linguistic variation complicated communication surrounding care (RQ1)

Patient navigators consistently emphasized that being non-native English speakers imposed communication challenges on clients when accessing care. However, these language barriers included linguistic variation that went beyond the support of translators (human or AI-powered).

Within native Spanish speakers, dialect and colloquial differences between various countries or regions sometimes created misunderstandings (P9, P10, P12). Furthermore, merely being from a country where Spanish is the official language did not guarantee that an individual was a native Spanish speaker. Some navigators reported frequently supporting individuals from Guatemala, where the official and most spoken language is Spanish, but where there are also over 20 Mayan languages spoken, such as Q'anjob'al or K'iche'. As a native Spanish speaker from Mexico, P10 recounts an experience while supporting her students:

Kids from Guatemala and Honduras have words I've never heard before. Sometimes they try to explain it, and it becomes even more confusing. One of the kids described his condition as "falling asleep," and I was trying to explain seizures, but they have a different word for seizures in his language from Guatemala... Even when we all speak Spanish, we all have different words.

This linguistic variation posed challenges for medical interpretation, as most Spanish interpreters that the navigators and their patients encountered were from Mexico and thus unfamiliar with other dialects or languages. P10 explained that individuals "speaking Q'anjob'al or other Guatemalan languages often struggle, since phone

interpreters use words they can't understand." Patients recognized the limitations of interpretation services. For example, when asked for language preferences, Guatemalan individuals often default to Spanish despite inevitable misunderstandings because Spanish interpreters were easier to access (P3, P5).

The context of conversations also played a role in the nuances and connotations of words or expressions. P9 explained that although medical terminology is generally universal, "*words like 'stomach', 'chest', 'shoulder', or 'neck' can vary slightly. Sometimes translators use words from different dialects or formalities, which can confuse patients. Small differences can sometimes be the issue for patients.*" However, navigators generally agreed that patients still understand the main points even if specific words differ slightly. The dialect mismatches contributed more to friction that reduced their comfort and ease of interaction with the medical system.

4.2 Cultural differences led to friction with the U.S. healthcare system (RQ1)

Navigators pointed to cultural beliefs and values of their clients that clashed with U.S. healthcare practices and western medicine in general. P10 described her students' distrust of the U.S. health system, saying that "*even students who have been here for many years don't go to the doctor here. They talk to their grandmas or their moms in Guatemala... and their family sends them medicine.*" P10 also recalled a particular instance in which the cultural belief of *brujería* (witchcraft) of her student from Guatemala obstructed his opportunity to receive care in the United States:

He kept having horrible cramps in his legs at night and spine pain. We went to the doctor, who recommended x-rays and additional tests, but he never wanted to go. He said he knew what he had: a problem caused by a type of demon in Guatemala, and the only cure was to see a curandero there. This is more common than I would like to see. Many kids say, "I went to the doctor, and they say I don't have anything, but I know I have it, and they cannot see it because they're not from my country. Only people from my country can see it."

Many clients preferred to follow the medical traditions from their native cultures, which may sometimes be at odds with healthcare practices recommended in the U.S. Clients often refrained from disclosing their home practices to their providers of differing backgrounds due to fear of being judged (P5), thus increasing the disconnect between providers and their knowledge of cultural practices. P6 highlights the following example around sleep practices for babies:

Doctors recommend cribs, but families often co-sleep. They'll usually tell the doctor they use cribs because they know it's the expected answer. If I'm there, I might say, "If they're co-sleeping, what should they keep in mind?" That way the doctor can offer safer practices.

The cultural disconnect can be further complicated by a deeply-rooted respect for authority that Hispanic cultures often uphold. P6 explained that "*the doctor is the authority, the translator is the*

authority, and [the patients] just sit there nodding their head, so they often leave saying they didn't understand." P10 and P11 echoed nearly identical experiences. The navigators also acknowledged that being proactive necessitated advocating for their clients when communicating with providers and other authority figures. P6 said: "When I see that it doesn't look like they're understanding something, I prompt them like, 'Remember you told me you had a question about this?' So it's become a really big part of what I do."

4.3 Reading and digital literacy limited technology use (RQ1)

Both reading literacy and digital literacy were barriers for many Spanish-speaking individuals in the communities that the patient navigators supported. P11 acknowledged a generation of immigrants that "*had to move to the States in the middle of their schooling, and switching languages mid-education has an impact. Not all of them finished secondary education.*" Consequently, most clients who were illiterate could not read English nor Spanish, rendering it nearly impossible to utilize phones or computers without assistance. Navigators agreed, however, that even if their clients were educated or literate, specialized medical knowledge would still pose issues in understanding care information.

In some cases, navigators aimed to circumvent reading literacy issues via technology accessibility features such as sending audio messages rather than text or touching pictures to navigate (P6). However, these practices sometimes collided with many clients' lack of digital literacy. P6 described an unexpected challenge when accommodating Guatemalan families with low reading literacy:

"I created a flyer with pictures and a QR code that they could scan and hear the information in Q'anjob'al, but we learned that a lot of families didn't know how to use a QR code. I thought this was a really easy way for them to be able to hear information in their native language, but then there was another barrier."

Digital literacy varied greatly across LEP individuals. Navigators attributed generational differences to the range of familiarity with technology: "*Most adults never had to use a computer before. Families here for many years already have teenage or adult children who handle technology, so adults don't feel the need... even to use email. However, new immigrants, here for 5-10 years, force themselves to learn technology because even job applications are online now*" (P10). P8 states that most of his adult clients still use flip phones or landlines and do not feel the need to use a smartphone, even if given one. On the other hand, navigators that worked with teenagers and young adults explained that their younger clients are comfortable with technology. P10, a school district family liaison, explained that it is easy for teenagers that had never used a phone or computer before immigrating to the U.S. to adopt these technologies effectively.

Low digital literacy often stemmed from barriers to access technology in the first place, creating additional sources of stress and confusion when seeking medical care. Clients of P13, a social worker in a major metropolitan area, often "*use old phones... which are now considered obsolete. They run into connection problems, apps that don't work well, or just really slow devices. Patients sometimes give up. That adds stress - on top of being sick, now they're also struggling*

with technology." P3 echoed this sentiment, citing financial burdens as a barrier to accessing usable phones or apps. Several navigators said very few of their clients owned laptops or computers, and P6 and P14 said most of their clients did not have stable internet at home (P6's clients lived in trailer parks and had to go outside the trailer to get better phone service) and instead relied on mobile hotspots. P4 noticed that most individuals do not even know about new technology, highlighting a lack of educational resources in the community. This unfamiliarity with technology creates discomfort: P12 described that one of the students in her digital literacy class "*was so nervous, scared to even touch the computer. She didn't want to break it.*" Barriers to access and low digital literacy caused patients to struggle with even small tasks that seemed trivial even to navigators (P6). For example, patient navigators needed to show their clients how to join Zoom meetings (P6), maneuver the cursor on computers (P12), and overcome frustration with applications that require verification or extra steps (P13).

At the same time, LEP individuals recognized the importance of technology for accessing care. P3 realized that his clients "*understand the importance of investing in technology.*" P12 and P14, program coordinators of a digital literacy program within a social services organization that serves Spanish-speaking individuals, aimed to increase educational resources and access to technology. They taught individuals in the community how use computers, AI, and the internet to search for information. P14 said that if given opportunities and support to overcome access barriers, "*students and community members genuinely want to learn—they have the desire to improve.*" All navigators agreed that with proper support and guidance, AI has the potential to improve the wellbeing of their clients by increasing on-demand information access and translations for language support.

4.4 Privacy concerns further discourage use of technology (RQ1)

Independent of literacy issues, LEP individuals had heightened distrust of digital privacy policies and therefore hesitation to use technology, being afraid that their data would be used wrongly or end up in the possession of unintended entities (P8, P10). While nearly all navigators agreed that patients were generally wary of sharing personal data, one offered a contrasting view: P7, a school district parent liaison, reasoned that most of the families he works with cannot even read well in Spanish, so ethical concerns rarely cross their minds. However, some navigators drew examples from other applications that underscored their clients' concern for guarding their personal data. P5 worked with clients who "*keep money in a shoebox. If they don't trust banks or the government, they surely won't ask [AI] for help.*" P6 worked with families who refuse to even obtain driver's licenses:

"They say, 'No, I'll be in the system, [government officials] will find me.' It's a very real fear that impacts their lives and decisions in big ways. They know people who've been stopped without a license, they know the fees, the risks of police and court. And that's still preferable to them compared to being in the system."

These concerns stem primarily from administrative policies and immigration status (P3, P5, P12, P13), even for first-generation immigrants who have relatives or friends that are undocumented (P9). Many navigators themselves have experienced recently growing distrust from their own clients, despite already having established familiarity and trust. This reluctance to share personal information extends to patients' unwillingness to seek healthcare services, which usually require patients to disclose personal data (P8). Lack of familiarity with technology also created distrust: "[Clients] feel uneasy when websites ask for personal information. A lot of it comes from lack of knowledge—they don't understand what a chatbot is, so they assume it's a robot trying to steal their information" (P14).

Interestingly, navigators drew distinctions between types of data that their clients would be comfortable sharing with clinics and technology. P14 outlined the difference as: "They're very protective of sensitive information like Social Security numbers or bank accounts. But they're comfortable sharing details about feelings, medical issues, recipes, or business ideas—things that can't be stolen or hacked." Navigators generally agreed, drawing the line between "willing to give symptoms and medical history and maybe an email" but "hesitant with phone numbers, addresses, or other personally identifying information" (P6). These boundaries also extended to AI, as most navigators reasoned that clients would be comfortable sharing their symptoms with AI to get information, but would be less willing to log in to an account and save their chat history.

Navigators employed various strategies to assuage their clients' privacy concerns. P4 emphasized to her clients the confidential nature of their interactions, informing them of their rights to take action or bring her to justice if their information is shared with any outside sources. P3, P8, P10, P12, and P13 employed similar strategies but also noted the trade-offs: as P3 explained, "We need to sometimes reassure them that...the state won't share their information. The forms even say the information is confidential. Sometimes we tell them they're not required to give certain information, so many clients end up providing only very basic information." P10 emphasizes that her clients need reassurance that their information would not be shared with anyone else, leveraging the personal relationship and trust she established with her clients in order to obtain their information to support them.

4.5 Opportunities for AI: reducing social barriers and institutional constraints (RQ2)

Navigators identified two ways that AI systems would be uniquely positioned to support LEP individuals seeking care: reducing sentiments of alienation and alleviating resource constraints.

Navigators described that many of their clients felt unheard, rejected, or embarrassed by the healthcare system. P1 explains that "*in Hispanic culture, people like to talk, share details, and give background. Appointments are usually rushed, so doctors usually want 'yes/no' answers about symptoms, but patients may tell their whole life story first. That mismatch in communication style can definitely be a barrier.*" Other patients left appointments feeling like their concerns went unheard due to language or cultural misunderstandings that impeded their ability and confidence to advocate for themselves (P5, P11). Oftentimes institutional restrictions on interpreters prevented them from addressing these issues. At P6's clinic, the interpreters

must strictly provide word-for-word translations, barred from intervening when they perceive misunderstandings between patients and providers. Patients also experienced embarrassment or discomfort when describing medical conditions, especially if doing so in English, causing the patients to refrain from elaborating on their conditions (P2). Lastly, telehealth methods, albeit convenient, may exacerbate these communication disconnects. P5 lamented that telehealth "*make[s] it hard because you can't see the patient to gauge their pain, and Wi-Fi issues make it worse.*" Collectively, these barriers caused patients to feel alienated and not seek care: "*Because English isn't their first language, they're extra cautious. They feel vulnerable and worry about being scammed. They know they're a group people might take advantage of, so they're wary*" (P14). Patient navigators proposed that some of these issues could be alleviated by AI. For example, P2 reasoned that talking to a chatbot about a medical condition would eliminate the sense of embarrassment or social judgment that resides in a human-to-human conversation. P6 proposed the idea of an AI interface that transcribes patient-provider conversations in real-time and detects potentially confusing concepts or jargon in the conversation, allowing patients to gain clarification in real-time without causing embarrassment by verbally interrupting or admitting their confusion. P11 reasoned that talking to AI as a post-visit debrief could help patients feel better by externalizing their sentiments and receiving comfort.

Navigators also identified ways that AI systems could alleviate institutional burdens and resource constraints. Most clinics and emergency rooms are frequently stretched thin, forcing patients to endure long wait times for an interpreter or a provider, or even reschedule their appointments completely. Navigators agreed that AI could help fill the interpretation gaps by serving as an on-demand translator for when human interpreters are not readily available, thus alleviating wait times and frustration for LEP patients. Navigators whose work required communicating large volumes of complex information to clients noted that AI could help identify errors and ensure consistency, especially when fatigue set in from long work hours (P3). Some navigators also cited not having enough bandwidth to routinely follow-up with clients, such as to ensure correct understanding and adherence to care plans (P13). P9 proposed an AI system that proactively sends check-in questionnaires to patients on a regular basis to help monitor their progress and health without relying on scheduling official visits. This regular communication would also serve as an intervention mechanism to prevent patients from waiting until they are very sick to seek help (P10).

4.6 Risks of AI: loss of human connection and validation strategies (RQ2)

While navigators pointed to opportunities for AI to enhance LEP patient care, they also raised concerns about the uniquely-human support that many patients need. Nearly all of the navigators emphasized the significance of human presence as a source of comfort and encouragement for individuals while navigating healthcare, difficult circumstances, or loneliness. P10 described her personal journey battling a long-term medical condition:

"When I was at appointments, I was hearing new, scary information. What was really helpful was having someone next to me—a nurse who was very caring—who kept asking if I wanted to stop, if I understood, if I wanted water, if she could help me in any way. That human aspect is very important, especially when hearing scary news. In complex cases, having a human who shows care and presence is important."

P14 gave the examples that his clients would rather hand a physical resume to a person in an office, rather than submitting it online, and they would rather have someone personally explain confusing documents such as a privacy policy, rather than asking for explanations from AI. He highlighted that *"it's the personable aspect that matters. They need to feel like someone cares,"* which is conveyed through the personal physical interactions. Navigators worried that these needs would at best make clients uncomfortable with AI and at worse remove a key asset of human support. P5, a community navigator from Mexico, explained:

"An AI might know the facts, but it's not Mexican, didn't grow up in Mexico, so it doesn't really understand me the way a person would. For example, Mexican remedy traditions—American doctors don't get them, but other people [from similar cultures] do. AI knows a lot about an egg cleanse, but it hasn't experienced it, so it doesn't know why we do it."

Navigators also anticipated risks with misinformation and mis-translations from AI. Most navigators experienced inaccurate information or translations themselves when they used AI in their work, but they worried that their clients would not have the same capabilities to validate outputs. P9 contended that AI translation systems *"really only work for bilingual people. I've had students submit translations without knowing how to adjust words depending on the context."* Other navigators reported similar experiences with AI performing poorly when translating idioms or words in specific contexts. On issues of misinformation, P10 asserted that her clients *"don't ensure information online is accurate. Many trust social media for important information. For example, if TikTok said the president would give green cards to everyone, they believe it. They don't know how to verify information yet."* Similarly, P11 emphasized medical misinformation from social media and word-of-mouth as a significant issue:

"Patients often lecture me about diets or remedies they saw on Facebook. Sometimes it's legitimate, sometimes it's not. Maybe it's not immediately harmful, but it complicates care. I've had patients stop blood pressure medication after hearing from friends it causes dizziness. That was a known side effect we had already explained. So then we have to re-educate, rebuild trust, and sometimes switch them to another medication just to remove the stigma around the original drug name. It complicates care - not necessarily bad, but challenging."

Navigators, then, extrapolate these concerns to AI as an information source. Some called for digital literacy education that includes

building skills in validating information accuracy, assessing trustworthiness of information sources, navigating online culture, and learning cybersecurity.

5 Discussion

Overall, patient navigators in our study were favorable towards the adoption of AI technologies to improve healthcare access and quality for LEP individuals. However, introducing AI into this ecosystem raises questions around how it might reshape communication between stakeholders (e.g., patient-navigator or patient-provider relationships). In this section, we discuss opportunities for developing AI tools for facilitating communication between LEP individuals, providers, and navigators. At the same time, our interviews surfaced a number of risks of AI, and so we consider when it might *not* make sense to develop new tools. For many patients, trust in a system is inseparable from the policies and institutions that govern it, meaning that even well-designed technologies can fail if they do not address broader systemic inequities. Thus, we discuss the implications of our study within these broader structural contexts. We do not generalize the following discussion and considerations to all LEP individuals or even all Spanish-speaking LEP individuals. Table 3 summarizes our findings of the barriers that LEP individuals face and the associated design considerations for AI tools.

5.1 New AI technology should be developed within current practices and relationships

Navigators discussed the difficulties for LEP individuals to adopt new technologies, skills, or even visit a new clinic. Prior work advocates for integrating telehealth within platforms familiar to the patients, rather than expecting them to adapt to new systems [10]. This method consciously and proactively includes marginalized populations. We propose 4 examples of how AI can be integrated according to this principle.

First, AI should be deployed on devices and platforms that LEP individuals already use. Navigators explained that their clients were generally more comfortable and had more access to phones (as opposed to computers, laptops, wearables, or other forms of technology). Therefore, AI tools should be mobile-friendly or even mobile-centric. Going further, chatbots could send reminders, answer questions, or translate information along familiar channels, such as SMS or WhatsApp, similar to past health interventions [1, 110]. In these ways, individuals would not be expected to learn to use a new device, download new apps, or navigate complex, unfamiliar interfaces.

Second, for individuals without access to stable internet or the newest technologies, system developers should consider employing smaller (e.g., quantized [25]) models that run efficiently on low-resource devices or require minimal bandwidth. While such models might sacrifice some compute-intensive capabilities (e.g. deep reasoning [85]), allowing patients to access tools without an internet connection could alleviate both digital access issues and privacy concerns. P6's anecdote of families needing to setup hotspots for mobile trailers to access the internet suggests that having tools that could go where individuals go might be more effective than tools that can do more but only with certain digital access. This ensures

Table 3: Summary of barriers LEP individuals face with respect to health technologies, how those barriers manifest, and associated design implications for AI.

Barrier	Observed Challenges	Implications for AI
Linguistic variations	<ul style="list-style-type: none"> Dialectal or regional colloquialisms within a language Context-sensitive word choices Indigenous languages within a Spanish-speaking country 	<ul style="list-style-type: none"> Adapt to dialects and colloquialisms to account for regional and cultural nuances Align models to individual preferences and mannerisms Expand models for low-resource languages
Cultural differences	<ul style="list-style-type: none"> Traditional or home remedies may conflict with western medical advice Fear of being judged prevents full disclosure Respect for authority discourages contradicting or asking questions 	<ul style="list-style-type: none"> Acknowledge cultural practices and values while offering practical steps for care Capture nonverbal cues that signify discomfort Avoid misalignment or inappropriate advice due to lack of cultural context
Literacy	<ul style="list-style-type: none"> Low reading literacy in English and/or Spanish Low digital literacy due to limited experience with usable technology (phones, computers, Internet) Lack of specialized medical knowledge complicates understanding health information 	<ul style="list-style-type: none"> Voice- or picture-based controls Capture nonverbal cues that signify discomfort Educational resources and guidance that accompany AI to teach prompting and information validation skills Build simpler models that do not require state-of-the-art devices
Privacy	<ul style="list-style-type: none"> Reluctance to provide personal information Fear that personal data could end up in unwanted entities Hesitancy to engage with digital systems, preferring in-person means 	<ul style="list-style-type: none"> Offer options to access AI services without providing personal information; anonymize when possible Minimize storing data and history Guarantee confidentiality and privacy of data

that AI tools remain accessible to individuals who may face access barriers with outdated phones or intermittent internet service.

Third, AI systems for LEP individuals should not assume baseline digital or reading literacy (in any language). Navigators described that LEP individuals come from a wide range of education and literacy levels, and how even tasks they thought to be simple and accessible, such as scanning QR codes on a phone, can be obstacles. These anecdotes align with prior work that showed assumptions of baseline literacy or technological familiarity often exclude marginalized users from health technologies or digital services in general [8, 116, 120]. Prior work has established that speech-based interactions can overcome literacy barriers [90]. Given the dual threads of agents that can navigate complex digital environments [51, 81, 104] and generative voice-based interfaces [70], there is an opportunity to develop voice-based agents that can bridge both reading and digital literacy barriers. For example, agents might interact with patients as a single voice-based system but help them navigate other tools (e.g., Zoom, digital calendars, and email). Voice-based agents for translation may also serve well in the frequent instances in which interpreters, providers, or navigators converse with patients over the phone.

Lastly, system designers should consider cultural values that may lead individuals to engage with or reject new AI tools. Prior work established that cultural values may influence acceptance and choice of technology [93]. For instance, navigators emphasized the significance of the respect for authority in Hispanic cultures. In order to encourage comfortable and transparent interactions, chat or voice-based systems should adopt the tone of a navigator or peer, while giving information with the expertise of a provider.

Overall, AI systems should adapt to the circumstances of the users, leveraging their existing skillsets and practices whenever possible and minimizing the amount of new knowledge, technology, or skills they would have to learn. One way to do this is to directly involve patients in the development process [2] to lower barriers to incorporating AI seamlessly into their existing practices and cultures.

5.2 Psychology of trust suggests private, smaller models

Adoption of AI in healthcare must account for the psychological realities of LEP individuals, who may hesitate to disclose sensitive health information if they fear it could be misused or linked to immigration status. Experiences of discrimination and marginalization can heighten mistrust in institutions, leading individuals to approach new technologies with caution. This underscores the importance of embedding psychological safety and relational trust into AI systems, rather than focusing narrowly on technical accuracy alone.

However, privacy poses a paradox: while patients are protective of their personal information, tailoring generated responses to their needs requires access to such information. This tension reveals the role of needs assessments, as not all patients want to achieve the same goals or functionalities with AI. Some may only seek real-time translation and may not care as much about their data. Others may want to seek personalized support but feel unsafe giving their personal information to an AI system. P6 suggested features that would allow users to utilize nicknames or other anonymizing information to help patients feel more comfortable without disclosing their data. Respecting patient agency by offering configurable options allows

for greater willingness to utilize these technologies. While many chat services have options to not share chat logs, navigators pointed out that their clients would distrust any privacy policy, regardless of any mentioned privacy protections, suggesting that such options might not mitigate concerns. Similar to concerns about digital access, privacy issues suggest that smaller models that can run and store chats locally would be preferable.

5.3 Designing for the long tail of linguistic and cultural variation

Languages and cultures are not monolithic. In our study, patient navigators highlighted how dialect differences can cause misunderstandings, even if interpretation is available. Furthermore, individuals from predominantly Spanish-speaking countries did not necessarily speak Spanish. Though recent years have seen improvements in the multi-lingual capabilities of the LLMs powering AI [28, 50], our findings suggest linguistic variation can go beyond different languages, dialects, or even across families.

AI systems should prioritize dialect-level adaptation, ensuring that they can flexibly account for regional and cultural nuances. Personalization should extend beyond language and into cultural norms, values, and practices [74]. For example, AI systems should acknowledge how cultural beliefs around medicine intersect with biomedical advice. AI systems should also capture nonverbal cues in order to fully understand an LEP patient's perspectives, as patients may not always verbalize their thoughts fully or correctly when under pressure or vulnerability in a setting like receiving medical care. While data might be sparse to train models to do this effectively for every speaker, vision-language models [24] and methods to align models [103, 119] to individual preferences might offer an avenue for chatbots to continually learn vocabulary unique to a patient.

Previous studies have shown that providers use online questionnaires, cameras, and wearable technology to collect information about their patients' personal values and background, in addition to medical information directly related to their symptoms [17]. AI tools have the potential to not only help dynamically collect information about lived experiences and cultural values, but also provide summaries or explanations to providers of different cultures than their patients by, for example, synthesizing multiple channels of data into insights or points of interest.

5.4 When AI might help, but not be the best answer

Our study showed that while AI presents promising opportunities to support LEP individuals seeking care, they may not always be the most appropriate or effective solution. In some cases, strengthening existing practices or deploying low-tech strategies may be more impactful than introducing additional technology complexity.

First, researchers generally agree that technology should aim to complement, rather than replace, human expertise in healthcare settings [9, 101]. Navigators in our study aligned with these views, consistently emphasizing the irreplaceable role of human presence (and associated trust, empathy, and relational comfort) in care.

Second, communication needs could be addressed through offline resources rather than technology. Static resources (e.g., FAQs, worksheets, pamphlets) that can be helpful for conveying important

health information are traditionally written by providers or navigators. Rather than attempting to replace these materials by communicating with new technology, AI could instead play a supporting role by, for example, generating these resources that are then refined by humans. These resources could then be distributed with minimal digital access as printed sheets or shared audio files [113], avoiding the privacy, technology access, or literacy burdens associated with AI tools. This workflow shows how AI can strengthen existing communication channels without introducing additional barriers.

Third, educational scaffolding should accompany any AI interventions, as adopting new technologies often requires new skills. Navigators described investing significant effort in teaching their clients foundational skills such as using computers, sending emails, and logging into online patient portals. Introducing AI would necessitate new forms of digital literacy to ensure safe and productive interactions. In some cases, these barriers may outweigh potential benefits, suggesting that investments in improving existing workflows, interpreter access, or patient education may create more immediate impact as a first step rather than deploying new AI tools.

5.5 Limitations and Future Work

While the storyboards and scenarios provided a useful structure for discussion, they may have guided participants toward particular ideas or interpretations. Nevertheless, we found that grounding the discussion in the participants' experiences allowed them to critically reflect on how AI might affect their existing practices and relationships. Our findings are also context-specific and do not necessarily generalize to other LEP populations or even Spanish-speaking populations in different regions of the U.S. Cultural, linguistic, and systemic characteristics of any particular area may shape the needs and experiences of those patients and navigators in ways that may differ from our study context. Future work should seek out the perspectives of LEP patients themselves and how they perceive their interactions with navigators and providers and their views on AI technology for healthcare. Building prototypes or low-fidelity design probes informed by the findings of this study, such as voice-based interfaces, could ground the participatory discussions with patients while offering insight into the validity and extensions of our findings. In this way, we can ensure that AI systems are built to be responsive and effective to the needs of the communities they intend to serve.

6 Conclusion

In this study, we interviewed 14 patient navigators who support Spanish-speaking LEP individuals in receiving healthcare. We identified key sociotechnical and cultural factors that shape the way LEP individuals access health technologies and communicate with providers. Our findings reveal linguistic, cultural, literacy, and privacy barriers that LEP individuals face when interacting with healthcare services and technologies. These findings motivate opportunities for AI to be situated within existing practices and limitations, while considering issues of data privacy, misinformation, and cultural alignment. Future work should solicit the perspectives of LEP individuals to directly inform AI system designs that best support marginalized communities in receiving healthcare.

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A Appendix

A.1 AI Literacy Questionnaire

In the recruitment form, we adapted a basic AI literacy questionnaire from [43]. All questions were asked on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questions were as follows, along with the mean and standard deviation of the participant responses:

- (1) I understand the basic concepts of artificial intelligence.
($M = 3.86, SD = 0.86$)

- (2) I can judge the pros and cons of AI. ($M = 3.64, SD = 0.74$)
(3) I keep up with the latest AI trends. ($M = 2.86, SD = 1.03$)
(4) I am comfortable talking about AI with others. ($M = 3.86, SD = 1.23$)
(5) I can think of new ways to use existing AI tools. ($M = 3.36, SD = 1.08$)

A.2 Storyboards

We include the list of all the storyboards in our study in [Figure A1](#).

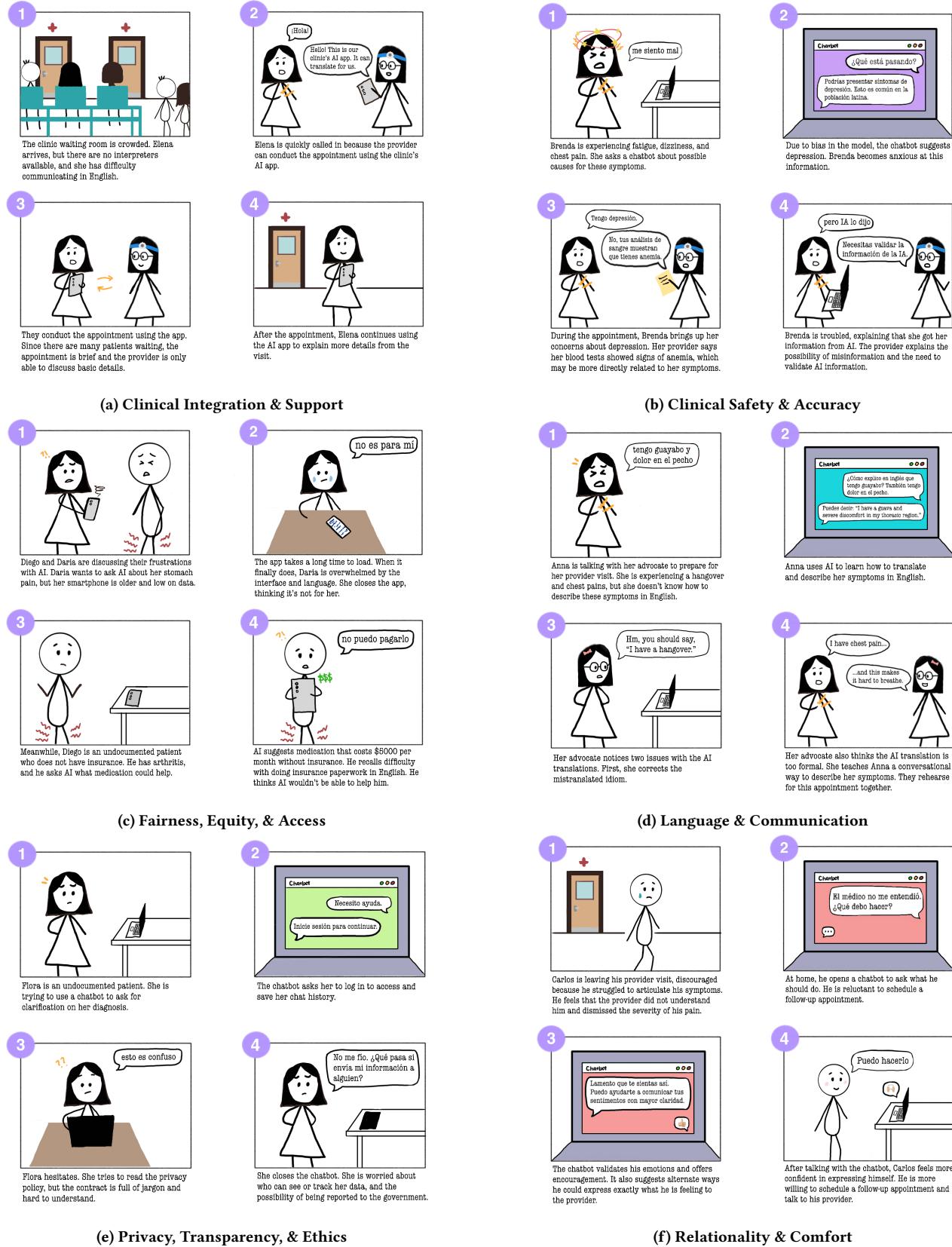


Figure A1: Storyboards used in interviews with patient navigators.