

Real-Time Language Equity in Digital Health Platforms: A Systematic Review of Multilingual Clinical Interfaces and Their Impact on Outcomes for Patients With Limited English Proficiency

Brian Mansoury¹, Joshua Khorsandi¹, Justin Kaheni¹, Aria Damavandi¹, Michael Kahen¹, Moez Khorsandi²

¹Kirk Kirkorian School of Medicine at UNLV

²Clinical Professor of Surgery, Western University of Health Sciences

KIRK KERKORIAN
SCHOOL OF MEDICINE | UNLV

Introduction

Patients with limited English proficiency (LEP) experience substantial inequities in diagnosis, treatment, and follow-up, often due to communication barriers embedded within digital health systems. Although many platforms incorporate translated content or interpreter access, far fewer provide real-time multilingual interaction capabilities, such as automated translation layers, adaptive language switching, or culturally specific interface logic. This systematic review evaluates the effectiveness, safety, and patient experience outcomes of multilingual clinical interfaces designed to support LEP populations across digital health environments.

Objective

To evaluate how real-time multilingual clinical interfaces are currently applied across digital health platforms and assess their effects on communication quality, patient engagement, safety, and clinical outcomes for patients with limited English proficiency.

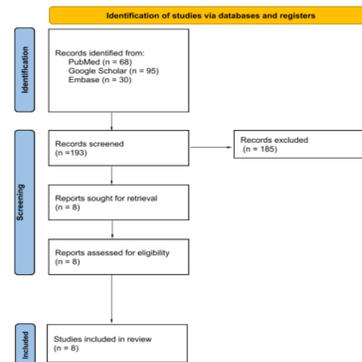
Methods

We systematically searched PubMed, Embase, Web of Science, Scopus, and IEEE Xplore for studies published from 2010 to December 2025. Inclusion criteria required evaluation of digital platforms—telehealth systems, patient portals, mobile health applications, or AI-driven triage tools—that integrated multilingual or real-time translation features for LEP patients. Two independent reviewers screened studies, extracted outcomes, and assessed quality according to PRISMA guidelines. Outcomes included diagnostic accuracy, adherence, communication comprehension, satisfaction, and health system utilization.

Methods cont.

Inclusion and Exclusion Criteria

Inclusion	Exclusion
<ul style="list-style-type: none"> Digital health platforms with multilingual or real-time translation for LEP patients Reported relevant outcomes 	<ul style="list-style-type: none"> No LEP focus No multilingual/translation features Non-digital studies



Results

Of 193 screened records, 8 studies met criteria. Multilingual interfaces enhanced comprehension and satisfaction across chronic disease management, emergency triage, pediatrics, and mental health settings. Real-time translation systems enhanced message clarity, though accuracy varied by dialect and complexity, with some tools reporting error rates as high as 30%. Platforms that incorporated culturally and linguistically tailored content—such as bilingual storytelling or adapted user flows—demonstrated engagement rates exceeding 60% and, in select trials, reductions in HbA1c of up to 0.8% and adherence odds ratios of 2.11. However, only 4 of the 8 studies evaluated safety outcomes such as translation error or misinterpretation risk, and none reported system-wide implementation or interoperability data.

Results cont.

Multilingual Digital Health for LEP Patients



Future Perspectives

Standardized Transparency Reporting

Standardize reporting of multilingual interface design, evaluation, and implementation across digital health systems.

Robust Privacy Evaluation

Use consistent frameworks to assess translation accuracy, misinterpretation risk, and patient safety outcomes.

Clinical Integration & Governance

Develop interoperable systems and governance frameworks for safe, large-scale implementation across care settings.

Conclusions

Real-time multilingual digital health interfaces can substantially improve communication, engagement, and selected clinical outcomes for LEP patients, but evidence remains fragmented. Robust evaluation frameworks, safety monitoring for translation errors, and scalable integration strategies are urgently needed to support equitable connected care for linguistically diverse populations.