REVIEW ARTICLES

Spanish Language Preference and Decreased Hearing Aid Uptake among U.S. Adults

Laura Gaeta, PhD[1], Christopher Brydges, PhD[2]

[1] Communication Sciences and Disorders, California State University, Sacramento, [2] West Coast Metabolomics Center, University of California, Davis

Keywords: Healthcare disparities, limited English proficiency, health equity, language barriers, access to care

https://doi.org/10.59867/001c.170892

Journal of the National Hispanic Medical Association

Vol. 4, Issue 2, 2026

ABSTRACT

Study objective

The purpose of this study was to explore the language-associated disparity in hearing aid uptake between Spanish- and English-interviewed adults using nationally representative data.

Background

Hearing aids improve communication and quality of life among individuals with hearing loss. Despite the benefits of hearing aids, uptake remains low. Disparities related to hearing aid use have been studied in underserved populations, identifying barriers due to race, ethnicity, culture, and socioeconomic status. Language barriers are a potentially modifiable driver of inequity in hearing healthcare.

Study design and method

Participants were 8,038 adults from the 2009-2010, 2011-2012, 2015-2016, or 2017-2020 cycles of the National Health and Nutrition Examination Survey. Interview language (English or Spanish) was the independent variable, hearing aid use was the dependent variable, and participant age, gender, level of education, income-to-poverty ratio, and hearing loss were covariates.

Conclusions

Spanish interview status was associated with lower hearing aid uptake, both before and after accounting for audiometric data and socioeconomic factors. The results highlight language access as an important determinant in hearing healthcare access and rehabilitation and support for language concordant care.

Background

Hearing loss affects about 20% of American adults, which makes it a significant public health issue.[1] However, hearing aids, a common treatment for hearing loss, are used by less than 20% of American adults who have hearing loss,[2] despite the benefits.[3-5] Reasons for low uptake include the discomfort and fit of the device, perceived lack of benefit or severity of hearing loss requiring treatment, decreased self-efficacy, and high cost.[6-8] Accessibility factors (e.g., availability of services, cost of services, and physical

distance or public transportation[9-11]) can also contribute to barriers encountered by patients seeking hearing healthcare services. Research on disparities in access to hearing healthcare services, such as by race and ethnicity, has been increasing, identifying patterns across areas like social determinants of health,[12] hearing aid use,[13] access,[14] immigration status,[15] and newborn hearing screening outcomes.[16]

Theoretical/Conceptual Framework

Another area of disparities research is related to language, particularly the non-English primary language spoken by patients at home, as diversity of this population has also been growing.[17] Patients who report having English as a second language and with limited reading, writing, speaking, and understanding abilities are considered to have limited English proficiency (LEP).[18] Patients who have LEP have poor health outcomes and face barriers when accessing healthcare,[19] which positions them as an underserved population that warrants further study. Though prior research has identified language-related barriers to hearing testing and hearing aid use,[20-22] there have been fewer studies quantifying the disparity in device uptake in an adult population-based design.[23,24]

Spanish is the most spoken non-English language in the United States,[25] so individuals who primarily or only communicate in Spanish may encounter unique challenges when navigating an English language-dominant healthcare system. The National Health and Nutrition Examination Survey (NHANES)[26] provides an opportunity to examine language-associated disparities in hearing healthcare, specifically, hearing aid use using publicly available cross-sectional data for secondary analysis. The purpose of this study was to investigate the language-associated disparity in hearing aid uptake between Spanish- and English-interviewed adults using NHANES data. One of the NHANES items is the language (English or Spanish) in which the interview is conducted; responses to this question were used as a proxy for limited English proficiency if the participant indicated Spanish as their preferred language. Previous research that defined LEP broadly reported limited adjusted associations between LEP and hearing aid use.[20] In contrast, we focus specifically on Spanish-interviewed adults to estimate a language-specific disparity.

Methods

Participants

Participants were 8,038 adults aged 20 years or older who participated in the 2009-10, 2011-12, 2015-16, or 2017-20 cycles of the National Health and Nutrition Examination Survey. NHANES is a continuously conducted

survey that evaluates the health and nutritional status of the civilian noninstitutionalized population in the U.S. It employs a sampling method that results in a nationally representative sample.

Data Collection

All demographic data and hearing aid use data were collected in the home by trained NHANES interviewers using a computer-assisted personal interviewing system.

Measures

The variables of interest were the language of the interview (either English or Spanish), participant age, gender, level of education, income-to-poverty ratio, and whether they currently or ever used a hearing aid. Hearing loss was defined as >= 25dB pure tone average threshold of speech frequencies (500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz) in the better ear from the NHANES audiometric examination.

Analysis

All analyses were conducted in R 4.5.1.[27] For each study item, "I don't know" or refusal to respond was treated as missing data. Any participant who did not have complete data was removed from the final analyses. In all analyses, hearing aid usage was the dependent variable, and interview language was the independent variable. Age, gender, education, income-to-poverty ratio, and hearing loss were covariates. A series of univariate analyses were conducted to test for raw differences between interview language groups with regards to hearing aid usage and covariates. Specifically, Wilcoxon rank sum tests were used to test for differences in age and poverty-to-income ratio with rank-biserial correlations as measures of effect size, and chi-square tests were used to test for differences in gender, education, hearing loss, and hearing aid usage with Cramer's V as measures of effect size. For multivariate analyses, given the highly imbalanced nature of the data (i.e., 3.7% of the sample reporting hearing aid usage), logistic regression with Firth's bias reduction method was conducted.[28] Three regression models were run: first, an unadjusted model where only interview language predicted hearing aid usage (i.e., no covariates) to demonstrate a raw association between the two constructs; second, with hearing loss and income-to-poverty ratio included as covariates, to control for clinical need and socioeconomic status; third, with all covariates included to control for all relevant demographic factors. These three models were then re-run using a subset of the data where only individuals with hearing loss were included in analyses (and hearing loss status was removed as a covariate) for robustness testing. NHANES survey weights were applied to each model due to the systematic oversampling of underrepresented groups in the surveys. In each model, a predictor was considered to be statistically significant if the 95% confidence intervals of the odds ratio (OR) did not overlap with 1.

Table 1. Descriptive Statistics of Participant Demographic Characteristics (N = 8,038)

Variable	Statistic
Age (years) *M* (*SD*)	47.37 (16.97)
Gender *n* (%)	
Female	4,131 (51.39%)
Male	3,907 (48.61%)
Education *n* (%)	
Less than 9th grade	621 (7.73%)
9-11th grade (Includes 12th grade with no diploma)	952 (11.84%)
High school graduate/GED or equivalent	1,771 (22.03%)
Some college or AA degree	2,546 (31.67%)
College graduate or above	2,148 (26.72%)
Poverty-to-income ratio *M* (*SD*)	2.51 (1.63)
Hearing loss *n* (%)	
Yes	1,157 (14.39%)
No	6,881 (85.61%)
Hearing aid use *n* (%)	
Yes	300 (3.73%)
No	7,738 (96.27%)

Source: National Health and Nutrition Examination Survey (NHANES), 2009-20.

This study was exempt from any human subjects review due to its secondary analysis nature.

Results

Descriptive participant data is presented in **Table 1**. The age range of participants was 20 to 80 years. The two interview language groups significantly differed with regards to poverty-to-income ratio (W = 4,561,186, $p < .001$, $r = .24$), education ($\chi^2(4) = 1{,}714.2$, $p < .001$, $V = .46$), and hearing aid use ($\chi^2(1) = 22.72$, $p < .001$, $V = .05$). The two groups did not significantly differ in terms of age (W = 3,037,109, $p = .10$, $r = .02$), gender ($\chi^2(1) = 0.39$, $p = .53$, $V = .01$), or hearing loss ($\chi^2(1) = 0.64$, $p = .42$, $V = .01$).

To examine the association between interview language and hearing aid use, a series of Firth logistic regression models were fitted. In the unadjusted model, adults interviewed in Spanish had significantly lower odds of hearing aid use compared to those interviewed in English. This association remained strong after adjusting for hearing loss severity and income-to-poverty ratio. In the fully adjusted model, which additionally controlled for age, gender, and educational attainment, Spanish-language respondents continued to exhibit substantially lower odds of hearing aid use. Hearing loss severity was the strongest predictor in all models, and age, gender, income, and education were all also associated with hearing aid use. The pseudo R^2 of the final model was .37. **Table 2** presents the full results from each model.

Table 2. Firth Logistic Regression Results of Each Model with the Full Sample (N = 8,038)

	Model 1		Model 2		Model 3	
Predictor	*B*	OR (95% CI)	*B*	OR (95% CI)	*B*	OR (95% CI)
Intercept	-3.35	0.0350 (0.0349-0.0350)	-5.27	0.0051 (0.0051-0.0051)	-8.44	0.0002 (0.0002-0.0002)
Interview Language	-2.15	0.1164 (0.1156-0.1172)	-1.91	0.1484 (0.1473-0.1494)	-1.36	0.2558 (0.2539-0.2577)
Hearing Loss	-	-	3.84	46.347 (46.273-46.420)	2.91	18.287 (18.254-18.320)
Poverty-to-Income Ratio	-	-	0.11	1.1116 (1.1112-1.1121)	0.05	1.0487 (1.0482-1.0493)
Age	-	-	-	-	0.06	1.0579 (1.0578-1.0580)
Gender						
Male	-	-	-	-	Baseline	Baseline
Female	-	-	-	-	-0.48	0.6200 (0.6191-0.6208)
Education						
Less than 9th grade	-	-	-	-	Baseline	Baseline
9-11th grade (Includes 12th grade with no diploma)	-	-	-	-	0.51	1.6674 (1.6589-1.6760)
High school graduate/ GED or equivalent	-	-	-	-	0.46	1.5766 (1.5689-1.5844)
Some college or AA degree	-	-	-	-	1.06	2.8983 (2.8844-2.9124)
College graduate or above	-	-	-	-	0.82	2.2694 (2.2581-2.2807)

Note: Model 1 = no covariates included; Model 2 = hearing loss and poverty-to-income ratio included as covariates; Model 3 = all covariates included.

Source: National Health and Nutrition Examination Survey (NHANES), 2009-20.

The robustness of this finding was tested by repeating these analyses with only individuals who suffered from hearing loss (N = 1,157). The trends of the results were unchanged: In the unadjusted model, adults interviewed in Spanish had significantly lower odds of hearing aid use compared to those interviewed in English. This association remained strong after adjusting for income-to-poverty ratio. In the fully adjusted model, which additionally controlled for age, gender, and educational attainment, Spanish-language respondents continued to exhibit substantially lower odds of hearing aid use. In the final model, age, gender, income, and education were all also associated with hearing aid use. **Table 3** presents the full results from each model.

Discussion

The purpose of the current study was to identify a language-based proficiency in adults using nationally representative data from the NHANES. We found that Spanish-language respondents (a proxy for limited English proficiency) had significantly lower hearing aid use than those who completed the survey in English. Even after adjusting for hearing loss and poverty-to-income covariates, this association remained. This study demonstrates that language can negatively affect hearing aid adoption even though the "need" (defined

Table 3. Firth Logistic Regression Results of Each Model with the Hearing Loss Subsample (N = 1,157)

	Model 1		Model 2		Model 3	
Predictor	*B*	OR (95% CI)	*B*	OR (95% CI)	*B*	OR (95% CI)
Intercept	-1.01	0.3324 (0.3321-0.3327)	-1.44	0.2365 (0.2361-0.2369)	-5.09	0.0061 (0.0061-0.0062)
Interview Language	-2.33	0.0975 (0.0967-0.0984)	-2.14	0.1135 (0.1171-0.1192)	-1.63	0.1955 (0.1938-0.1973)
Poverty-to-Income Ratio	-	-	0.11	1.1135 (1.1129-1.1140)	0.08	1.0809 (1.0803-1.0815)
Age	-	-	-	-	0.05	1.0507 (1.0507-1.0508)
Gender						
Male	-	-	-	-	Baseline	Baseline
Female	-	-	-	-	-0.17	0.8412 (0.8398-0.8426)
Education						
Less than 9th grade	-	-	-	-	Baseline	Baseline
9-11th grade (Includes 12th grade with no diploma)	-	-	-	-	0.44	1.5569 (1.5487-1.5651)
High school graduate/ GED or equivalent	-	-	-	-	0.15	1.1600 (1.1542-1.1659)
Some college or AA degree	-	-	-	-	0.89	2.4237 (2.4117-2.4357)
College graduate or above	-	-	-	-	0.60	1.8188 (1.8095-1.8281)

Note: Model 1 = no covariates included; Model 2 = hearing loss and poverty-to-income ratio included as covariates; Model 3 = all covariates included.

as hearing loss and poverty-to-income ratio) is similar, suggesting that the disparity goes beyond hearing loss and income and reflects barriers in the hearing healthcare pathway. That is, two patients with similar hearing thresholds and financial backgrounds could have different odds of obtaining hearing aids if the interview were to be conducted in Spanish instead of English. The findings contribute to the research in hearing healthcare disparities by highlighting the influence of language on hearing aid uptake beyond the aforementioned confounders. Unlike prior work in which the adjusted association between LEP and hearing aid use was null,[20] our Spanish-specific exposure remained significantly associated with lower uptake after covariate adjustment, suggesting that barriers specific to Spanish-language speaking and device uptake are not captured by socioeconomic or audiometric covariates.

As in other healthcare fields,[29,30] language discordance in audiology exists throughout the pathway to care. This pathway includes initial help-seeking processes, assessment, and rehabilitation. Language has been identified as a barrier to help-seeking in audiology.[31] In assessment, the development of materials in non-English languages for speech audiometry, for example, can help with service provision for these patients.[32-35] Providers may rely on interpreters to facilitate communication, noting fragmented and longer counseling, which could limit their time to address goals and engage in

shared decision-making. However, even with interpreters, patients may still experience communication barriers for both oral and written modalities.[36] For treatment, decisions about amplification, for instance, may be underdiscussed, such as with technical language used during fitting and verification and self-management using English-language-dominant apps and manuals; for older adults and caregivers, this may cause greater attrition from the hearing healthcare pathway. The present study's findings suggest that patients facing language barriers may likely encounter reduced access to hearing healthcare services and lower hearing aid adoption due to differences beyond measured need or resources.

Language discordance can ultimately affect patient comprehension and overall health outcomes.[30] The Spanish-language respondents in this study likely encounter language-related barriers, such as limited availability of interpreters,[37] patient education materials available in non-English languages,[38,39] and clinician availability.[40-42] These barriers are present at all levels: patient, clinic, and system, requiring a multi-level approach to addressing language discordance. Standardization of health literacy efforts in the patient's preferred language can improve comprehension of appointment information.[43,44] Clinics can provide translated and culturally adapted materials when preferred by the patient to engage the patient and their family, improving adherence. Scheduling interpreters in advance or strengthening initiatives to increase the bilingual clinician workforce can allow for more protected time during appointments to maintain equitable counseling and communication depth. Tracking language in an electronic health records system can also help with data collection toward tracking retention of patients over time, such as through access and outcome metrics. Industry partners can develop Spanish-language-based apps, patient portals, and customer support to prioritize equitable uptake and retention. Future research should explore interventions that support patients with LEP throughout the hearing healthcare journey to determine the extent to which various efforts can improve access to services. Considering hearing healthcare to be a journey instead of a single help-seeking act, patients may need supports in identifying a hearing concern, discussing it with a healthcare provider, undergoing a diagnostic hearing evaluation (following a referral), and accessing the audiologist's recommended intervention(s). Throughout this multi-step pathway, patients can encounter barriers, such as limited access to primary medical and/or hearing healthcare, fragmented referral practices,[45] insurance and/or financial barriers, transportation issues,[10] and low awareness of hearing healthcare services in general. Therefore, any patient-level differences observed in hearing healthcare uptake may be the result of individual decisions, as well as barriers and facilitators within the U.S. healthcare system. Future work can also survey pathways for hearing loss identification, discussion with other healthcare professionals, and follow-up for intervention among patients with LEP.

There are several limitations for this study. First, we used the interview language as a proxy for LEP. However, bilingual respondents could have selected Spanish for greater comfort than in English for the interview. Likewise, respondents who have LEP may have selected English for the interview, meaning the true disparity could be underestimated. Second, the proportion of hearing aid users in the final dataset was very low (although the Firth bias reduction method for the logistic regressions did account for this). Third, generalization to other non-English language groups is cautioned, as further study and data collection are warranted. Last, the NHANES cycles included in this study may not fully reflect the over-the-counter hearing aid regulations, which became effective in 2022. Although access to these devices could impact participant responses, we are unable to explore whether the associations observed in these datasets (up to 2020) are affected by the regulations due to the implementation date (2022).

Contribution to the Literature

In conclusion, we used nationally representative data to demonstrate a robust inverse association between Spanish interview language and hearing aid uptake. Although the cross-sectional nature of the survey precludes any causal inferences, the proxy for LEP and the findings contribute evidence to literature on language-mediated barriers and access in rehabilitation outcomes. Language barriers could be modifiable drivers of equity issues in hearing healthcare access. Addressing language discordance across the entire audiology pathway would be a practical route to improve hearing aid adoption in this population and reduce disparities.

Funding declaration

No funding to report.

Acknowledgements

None to report.

Conflicts of interest

None to report.

Financial disclosures

None to report.

Submitted: April 06, 2026 EDT. Accepted: August 29, 2026 EDT. Published: October 26, 2026 EDT.

This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CCBY-NC-ND-4.0). View this license's legal deed at https://creativecommons.org/licenses/by-nc-nd/4.0 and legal code at https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode for more information.

REFERENCES

1. Haile LM, Orji AU, Reavis KM, et al. Hearing Loss Prevalence, Years Lived With Disability, and Hearing Aid Use in the United States From 1990 to 2019: Findings From the Global Burden of Disease Study. *Ear Hear*. 2024;45(1):257-267. doi:10.1097/AUD.0000000000001420

2. Chien W, Lin FR. Prevalence of hearing aid use among older adults in the United States. *Arch Intern Med*. 2012;172(3):292-293. doi:10.1001/archinternmed.2011.1408

3. Holman JA, Drummond A, Naylor G. Hearing Aids Reduce Daily-Life Fatigue and Increase Social Activity: A Longitudinal Study. *Trends Hear*. 2021;25:23312165211052786. doi:10.1177/23312165211052786

4. Mealings K, Valderrama JT, Mejia J, Yeend I, Beach EF, Edwards B. Hearing Aids Reduce Self-Perceived Difficulties in Noise for Listeners With Normal Audiograms. *Ear Hear*. 2024;45(1):151-163. doi:10.1097/AUD.0000000000001412

5. Tang D, Tran Y, Bennett RJ, et al. The Benefits of Hearing Aids for Adults: A Systematic Umbrella Review. *Ear Hear*. 2025;46(3):563-570. doi:10.1097/AUD.0000000000001620

6. McCormack A, Fortnum H. Why do people fitted with hearing aids not wear them? *Int J Audiol*. 2013;52(5):360-368. doi:10.3109/14992027.2013.769066

7. Meyer C, Hickson L, Fletcher A. Identifying the barriers and facilitators to optimal hearing aid self-efficacy. *Int J Audiol*. 2014;53 Suppl 1:S28-S37. doi:10.3109/14992027.2013.832420

8. Öberg M, Marcusson J, Nägga K, Wressle E. Hearing difficulties, uptake, and outcomes of hearing aids in people 85 years of age. *Int J Audiol*. 2012;51(2):108-115. doi:10.3109/14992027.2011.622301

9. Amlani AM. Effect of Determinants of Health on the Hearing Care Framework: An Economic Perspective. *Semin Hear*. 2023;44(3):232-260. doi:10.1055/s-0043-1769611

10. Gaeta L. Accessibility of university audiology clinics. *Am J Audiol*. 2026;35(1):206-217. doi:10.1044/2025_AJA-25-00169

11. Gallagher TJ, Hori K, Choi JS. Access to Hearing Healthcare and Barriers Among United States Veterans: A Survey-Based Study. *OTO Open*. 2025;9(1):e70055. doi:10.1002/oto2.70055

12. O'Brien M, Danis DO 3rd, Gall E, Woods K, Noonan K. Social Determinants of Health and Hearing Loss in U.S. Adults. *Laryngoscope*. 2024;134(6):2848-2856. doi:10.1002/lary.31268

13. Jacobs M, Ryan H, Ellis C. Racial-Ethnic Disparities in Hearing Aid Use: Price Responsiveness Among Older Adults with Hearing Loss. *J Racial Ethn Health Disparities*. 2025;12(1):489-498. doi:10.1007/s40615-023-01889-8

14. Gaeta L, Hang A. Identification of barriers to hearing healthcare access among Hmong older adults in the United States. *Hmong Studies J*. 25:1-22.

15. Halagur AS, Fitzgerald MB, Megwalu UC. Immigrant Status Disparities in Hearing Health Care Use in the United States. *Otolaryngol Head Neck Surg*. 2024;171(5):1415-1425. doi:10.1002/ohn.859

16. Gutierrez KL, Koyamatsu R, Lahiff M, Jutte DP, Chan DK. Disparities in Newborn Hearing Screening Outcomes in the United States From 2007 to 2017. *Otolaryngol Head Neck Surg*. 2024;170(2):535-543. doi:10.1002/ohn.517

17. United States Census Bureau. Why we ask questions about...language spoken at home. https://www.census.gov/acs/www/about/why-we-ask-each-question/language/

18. Civil Rights Division, U.S. Department of Justice. Limited English proficiency. 2025. https://www.justice.gov/crt/limited-english-proficiency

19. Ponce NA, Hays RD, Cunningham WE. Linguistic disparities in health care access and health status among older adults. *J Gen Intern Med*. 2006;21(7):786-791. doi:10.1111/j.1525-1497.2006.00491.x

20. Halagur AS, Megwalu UC. Association between limited English proficiency and hearing healthcare use in the United States. *Laryngoscope*. 2024;134(12):5122-5130. doi:10.1002/lary.31661

21. Pastucha M, Gos E, Skarżyński H, Jedrzejczak WW. Impact of Language Barriers and Age on English Hearing Test App Accuracy for Polish Users. *OTO Open*. 2024;8(4):e70047. doi:10.1002/oto2.70047

22. Wiseman KB, Cowan TM, Calandruccio L, et al. Device Use Among Spanish-English Bilingual and English Monolingual Children Who Are Deaf and Hard of Hearing. *J Speech Lang Hear Res*. 2025;68(1):282-300. doi:10.1044/2024_JSLHR-24-00197

23. Arnold ML, Arianna Reyes C, Lugo-Reyes N, Sanchez VA. Hispanic/Latino Perspectives on Hearing Loss and Hearing Healthcare: Focus Group Results. *Ear Hear*. 2022;43(6):1620-1634. doi:10.1097/AUD.0000000000001268

24. Arnold ML, Hyer K, Small BJ, et al. Hearing Aid Prevalence and Factors Related to Use Among Older Adults From the Hispanic Community Health Study/Study of Latinos. *JAMA Otolaryngol Head Neck Surg*. 2019;145(6):501-508. doi:10.1001/jamaoto.2019.0433

25. United States Census Bureau. What languages do we speak in the United States? 2022. https://www.census.gov/library/stories/2022/12/languages-we-speak-in-united-states.html

26. Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS). *National Health and Nutrition Examination Survey Data*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention

27. R Core Team. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing; 2025.

28. Heinze G, Schemper M. A solution to the problem of separation in logistic regression. *Stat Med*. 2002;21(16):2409-2419. doi:10.1002/sim.1047

29. Al Shamsi H, Almutairi AG, Al Mashrafi S, Al Kalbani T. Implications of Language Barriers for Healthcare: A Systematic Review. *Oman Med J*. 2020;35(2):e122. doi:10.5001/omj.2020.40

30. Cano-Ibáñez N, Zolfaghari Y, Amezcua-Prieto C, Khan KS. Physician-Patient Language Discordance and Poor Health Outcomes: A Systematic Scoping Review. *Front Public Health*. 2021;9:629041. doi:10.3389/fpubh.2021.629041

31. Mtimkulu TK, Khoza-Shangase K, Petrocchi-Bartal L. Barriers and facilitators influencing hearing help-seeking behaviors for adults in a peri-urban community in South Africa: a preventive audiology study. *Front Public Health*. 2023;11:1095090. doi:10.3389/fpubh.2023.1095090

32. Chue CLH, Soh KW, Mohamed Alias NJ, Loo JHY. Development of Singapore English speech audiometry test materials. *Proc of Singapore Healthcare*. 2024;33. doi:10.1177/20101058241227353

33. Gaeta L, John AB. Considerations in speech recognition testing of bilingual and Spanish-speaking patients, part I: Older children and adults. *Journal of Educational, Pediatric, & (Re)Habilitative Audio*. 2015;1:1-29.

34. Leclercq F, Renard C, Vincent C. Speech audiometry in noise: Development of the French-language VRB (vocale rapide dans le bruit) test. *Eur Ann Otorhinolaryngol Head Neck Dis*. 2018;135(5):315-319. doi:10.1016/j.anorl.2018.07.002

35. Marinova-Todd SH, Siu CK, Jenstad LM. Speech audiometry with non-native English speakers: The use of digits and Cantonese words as stimuli. *Canadian J of Sph Lang Path and Audiol*. 2011;35(3):220-227.

36. Wong H, Sheehan J, Sung V, Best S, Leigh G. Cultural diversity in early hearing detection and intervention: service provider perspectives. *J Deaf Stud Deaf Educ*. 2025;30(3):347-358. doi:10.1093/jdsade/enaf002

37. Quigley DD, Qureshi N, Talamantes E, Predmore Z. Language Concordance and Interpreter Use for Spanish-Preferring Patients: Qualitative Study of Perspectives from Primary Care Providers. *J Gen Intern Med*. 2025;40(11):2510-2522. doi:10.1007/s11606-025-09414-9

38. Alsuliman T, Alasadi L, Mouki A, Alsaid B. Language of written medical educational materials for non-English speaking populations: an evaluation of a simplified bi-lingual approach. *BMC Med Educ*. 2019;19(1):418. doi:10.1186/s12909-019-1846-x

39. Gaeta L, Garcia E, Gonzalez V. Readability and Suitability of Spanish-Language Hearing Aid User Guides. *Am J Audiol*. 2021;30(2):452-45. doi:10.1044/2021_AJA-20-00215

40. Committee on Accessible and Affordable Hearing Health Care for Adults; Board on Health Sciences Policy; Health and Medicine Division; National Academies of Sciences, Engineering, and Medicine, Blazer DG, Domnitz S, Liverman CT, eds. *Hearing Health Care for Adults: Priorities for Improving Access and Affordability*. National Academies Press (US); 2016. https://www.ncbi.nlm.nih.gov/sites/books/NBK385310/

41. Gaeta L, John A. Spanish-speaking Patients' Experiences with Hearing Health Care. *Hisp Health Care Int*. 2025;23(3):160-169. doi:10.1177/15404153241286766

42. Gaeta L. Access denied? Promoting inclusive practices in hearing healthcare. *Audiology Today*. 2025;37(5):22-33.

43. Kreps GL. Promoting patient comprehension of relevant health information. *Isr J Health Policy Res*. 2018;7(1):56. doi:10.1186/s13584-018-0250-z

44. Gaeta L, Garcia E, Brydges B. Development of a Spanish-language health literacy measure for audiology and otology (OIDO-HL).

45. Gaeta L, Downing A. An international survey of perceptions and practices of age-related hearing loss among physicians.