The Índice Flesch-Szigriszt and Spanish Lexile Analyzer to Evaluate Spanish Patient Education Materials in Otolaryngology

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Abstract

Objective: Evaluate the reading difficulty of Spanish patient education materials using the validated Índice Flesch-Szigriszt and Spanish Lexile Analyzer. Also to identify relationships between English and Spanish readability formulas.

Methods: All otolaryngology-related patient education articles written in Spanish from the health libraries of the top 10 US News & World Report-ranked hospitals, top 10 Doximity-ranked otolaryngology residencies, the American Academy of Otolaryngology–Head and Neck Surgery website and the US National Library of Medicine online section on ears, nose and throat were collected. Reading difficulty was assessed using the Índice Flesch-Szigriszt and Spanish Lexile Analyzer. Additional readability assessments included the traditional English tools: Flesch-Kincaid Grade Level, Flesch Reading Ease Score and the SMOG Score.

Results: A total of 497 articles were reviewed. The average INFLESZ score for all articles was 57.75, which is considered "Normal" and requires the reading ability of a student who finished *"Escuela Secundaria Obligatoria"* or 10th grade equivalent in the US. Average Spanish Lexile measure for all articles was 1062L, equivalent to a reading level between the 6th and 10th grade. English readability tools calculated a more difficult reading level compared to Spanish tools when performed on the same text.

Conclusion: Current Spanish patient education materials in otolaryngology may be too difficult for the average Spanish-speaking reader to understand. Future improvements may be warranted to improve the readability of educational materials and increase health literacy.

Introduction

- Patients who have limited English proficiency, particularly Hispanics who only speak Spanish, experience higher rates of miscommunication with physicians.[1]
- The Hispanic population is the largest minority group in the United States, comprising 17% of the total population. Many Hispanics can only speak and read in Spanish, and Hispanic patients have the lowest health literacy of all subgroups in the US.[6,7]
- The readability of a text is a surrogate for the difficulty of a text for a person to read and understand
- Previous studies have shown that the readability of otolaryngology-related patient education materials are too difficult for the average American reader.[2-5] Few studies have assessed the readability of Spanish health information.
- **Purpose**: perform a readability analysis of Spanish patient educational materials related to otolaryngology.
- **Hypothesis:** Spanish educational materials will be written at a level too difficult for the average Hispanic reader.

Methods and Materials

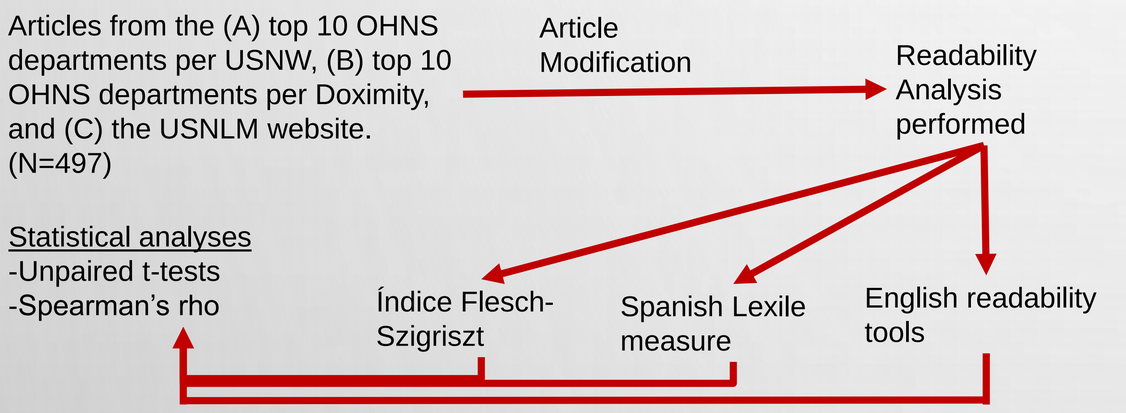

Table 1. INFLESZ scale.

Scores	Interpretation	Example	Spanish Example
< 40	Very hard	Scientific	Pediatric Clinics of North America.
40-55	Somewhat difficult	Scientific press release	11th grade biology textbook
55-65	Normal	General press	The House of the Spirits
65-80	Somewhat easy	Famous novels	The Bible.
> 80	Very easy	Comic books	Tom Thumb

Table 2. Spanish Lexile measure.

Grade	Reader Measures, Mid-Year: 25th percentile to 75th percentile (IQR)	Example of Text
1	Up to 280L	Mischievous Monkey - 230L
2	230L to 580L	The Polar Express - 460L
3	360L to 720L	Familiar Families - 610L
4	480L to 830L	The Summer of the Swans - 790L
5	620L to 950L	Harry Potter and the Order of the Phoenix - 880L
6	690L to 1020L	The Great Gatsby - 900L
7	780L to 1090L	The Hobbit- 1030L
8	820L to 1140L	Pride and Prejudice - 1070L
9	880L to 1180L	The Island of the Blue Dolphins - 1090L
10	920L to 1200L	The Canterville Ghost - 1150L
11	940L to 1210L	The Gold-Bug - 1170L
12	950L to 1220L	Robinson Crusoe - 1220L

Results

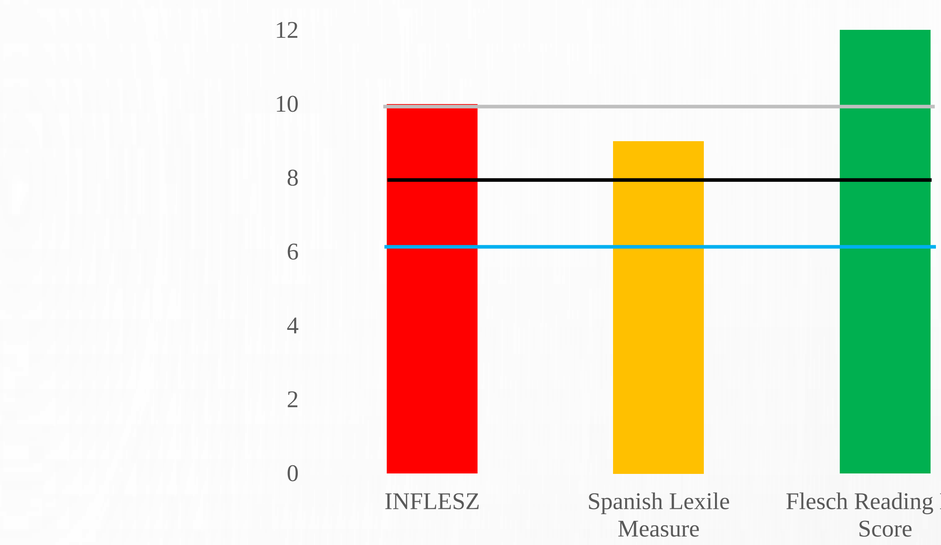

Figure 1: Reading grade required to understand patient health information in Spanish. *Blue line represents the 6th grade reading level recommended by the NIH. The black line represents the 8th grade reading level of the average American adult. The gray line depicts the 10th grade level, below which Barrio-Cantalejo defined health text as having appropriate readability.

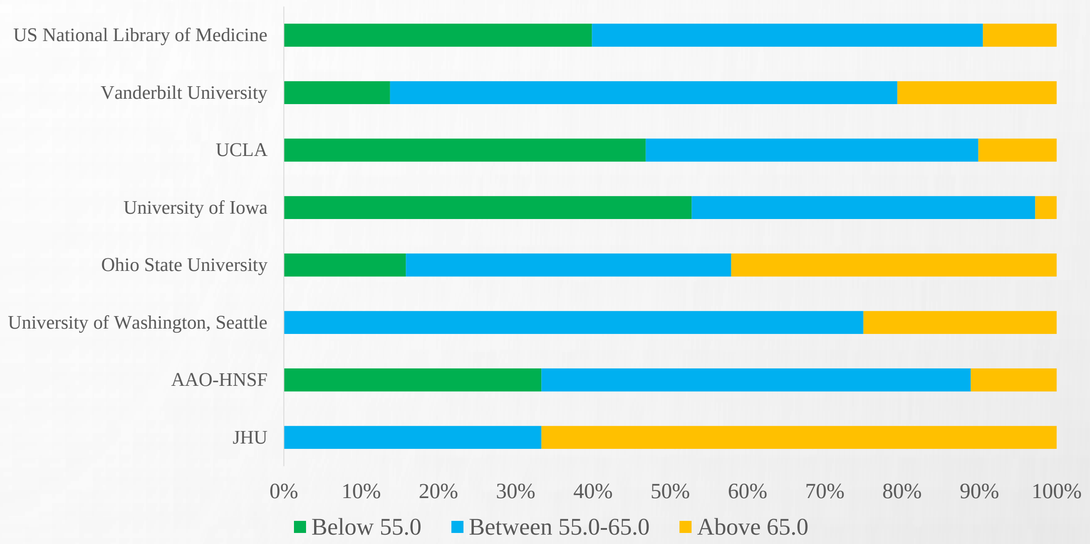

Figure 2: Figure 2: Distribution of texts by INFLESZ score. Abbreviation Key: INFLESZ= Índice Flesch-Szigriszt; JHU= Johns Hopkins University; AAO-HNSF= American Association of Otolaryngology-Head and Neck Surgery Foundation; UCLA= University of California Los Angeles.

Discussion

- Health materials written in Spanish are above the 6th grade reading level according to both INFLESZ and El Sistema Lexile para Leer.
- English readability tools, on average, calculated a more difficult reading level compared to Spanish tools
- Overall, scoring systems in both English and Spanish were consistent
- We found that Spanish patient education materials in otolaryngology are easier to read compared to Spanish materials in other fields.[8,9] Nevertheless, materials were still too difficult for the average Spanish reader.
- Our results showed a negative correlation between the INFLESZ score and the Spanish Lexile measure score. That is, easier texts have lower Spanish Lexile measures and higher INFLESZ scores.
- We also found a positive correlation between the IFLESZ score and the Flesch Reading Ease. This suggests consistency between readability formulas even when geared towards different languages.

Conclusions

The Hispanic population is the largest subgroup in the US, comprising more than 17% of the US population. Many primarily speak Spanish, and use Spanish as the primary language for their health related needs. Previous studies have shown that the readability of Spanish online health information often exceeds the reading ability of the average Spanish speaking user. In our analysis of Spanish online patient information specific to otolaryngology, we found that the majority of online patient health information was written at a level considered appropriate for the average adult in Spain, but beyond the reading level of the average American adult. These results were found across all readability assessments in both English and Spanish. Given that the Hispanic population in the US has the lowest health literacy of any subgroup, revising Spanish patient education materials to better fit the needs of these patients will allow them to make more informed decisions and improve health literacy.

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