Readability and Quality of Pediatric Audiology Reports

Allison Buerschen[1], Elizabeth A. Walker[1], Caitlin Sapp[2]
[1]The University of Iowa,[2]The University of North Carolina Chapel Hill

Background

- Communication between professionals on the Early Hearing Detection and Intervention (EHDI) team and caretakers can be insufficient. Audiologists are in a key position to increase effectiveness of communication throughout the EHDI process (Ditty, n.d.)
- Literature describing hearing loss (e.g., websites, pamphlets) typically has a readability score that is higher than the recommended fourth to fifth grade reading level (Joubert et al., 2014; Manchaiah et al., 2020; Squires, 2020).
- Clinical written reports are an important artifact of patient interactions and should be written to maximize reader understanding of the findings; however, readability has not been examined in diagnostic pediatric audiology reports.
- Addressing language, simplicity, usefulness, need for professional assistance, length of report, and expectations of the caregiver within diagnostic audiology reports leads to improved comprehension and increased sense of self-efficacy among parents of children with HL (Donald et. al, 2016).
- The Ensuring Quality Information for Patients (EQIP) is a valid, reliable tool designed to measure quality of written health care information (Moult et. al, 2004), but has not been applied to clinical reports to this point.
- The current study seeks to characterize the readability and quality of de-identified diagnostic pediatric audiology reports.

Research Questions

1. What is the average readability level of diagnostic pediatric audiology reports?
2. What is the quality of diagnostic pediatric audiology reports?
3. What is the correlation between the readability and quality of clinical reports?

Methods

- 379 de-identified reports from a Pediatrix database. Reports were written between 2014-2019, represented a first diagnosis of hearing loss, and only included infants who failed the newborn hearing screening.

READABILITY

Flesch-Kincaid Reading Grade Level
- Reading grade level of the material
- 5th-7th: easy to read, 8th-9th: plain English, 10th-13th: extremely difficult

Flesch-Kincaid Reading Ease
- Based on average number of sentences and syllables per 100 words.
- Score will be between 1 and 100, higher scores easier to read

Simple Measure of Gobbledygook (SMOG)
- Based on number of polysyllabic words (words with at least three syllables)
- 3-8: primary school, 9-12: high school, 13+: college education

Percent Passive Voice
- Passive Voice is a sentence in which the subject receives an action.
- EX: "Tympanometry was assessed using a 1000 Hz probe tone."

Methods

QUALITY

Ensuring Quality Information for Patients (EQIP)

• The EQIP addresses content and structure in the areas of appropriate use of pictures and illustrations, strong flow of information, lack of medical jargon and quality of life issues. Eleven categories are each scored as 2 ,1, or 0 for a maximum score of 22 points.

Examples:

- 3. Does the document contain easy-to-understand illustrations, diagrams or photos that are relevant to the subjects it covers?
- 8. Does the document address quality of life issues, including counseling on communicative and educational impact of hearing loss?

Results

Question 1: Average readability level of diagnostic pediatric audiology reports

	Flesch-Kincaid Reading Grade Level	Flesch-Kincaid Reading Ease	SMOG	% Passive Voice
Mean	11.56	38.15	14.05	0.35
Median	11.70	37.90	13.84	0.36
SD	1.39	8.62	2.06	0.15

F-K reading grade level was significantly correlated with percent passive voice ($r = .127$, $p = .01$). Percent passive voice was not correlated with the other readability measures.

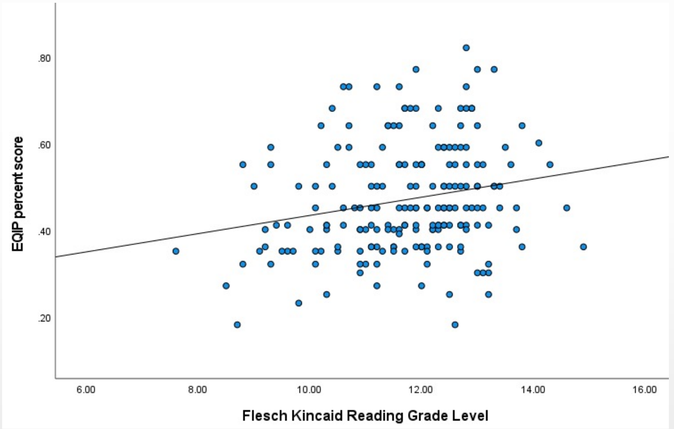
Question 2: Quality of diagnostic pediatric audiology reports

EQIP Question	Percent of Reports Scoring a 2
1. Everyday Language	0.27
2. Design/Layout Satisfactory	0.55
3. Diagrams/Illustrations	0.21
4. Logical Order	0.85
5. Referral Contact Details	0.10
6. Date Produced	0.91
7. Families Involved/Consulted	0.38
8. Counseling on Communication/Education	0.10
9. Other Sources of Information	0.08
10. Purpose of Testing	0.07
11. Benefits of Intervention	0.03

Results, cont.

Overall EQIP score (total points/22)	
Mean	0.47
Highest Score	0.82
Lowest Score	0.18

Question 3: Correlation between readability and quality of reports



- EQIP scores were significantly correlated with Flesch-Kincaid Reading Grade level ($r = .212$, $p = .003$). The correlation was positive, indicated that as difficulty in readability increased, quality of the clinical reports increased.
- There were no significant correlations between EQIP scores and Flesch-Kincaid reading ease or SMOG scores.

Discussion

- Reports were significantly higher than the recommended 4th grade reading level, averaging a readability level of approximately 12th grade.
- Reports need improvement in quality areas such as benefits of intervention, counseling on communication/education and referral contact information.
- Future testing could investigate the effects of type of clinical setting on readability.

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Contact information: Allison Buerschen (Allison-Buerschen@uiowa.edu)