

An Evaluation of Newborn Hearing Screening Brochures and Parental Understanding of Screening Result Terminology

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Introduction

- Approximately 27% of those who do not pass their screening are lost to follow-up or documentation (Centers for Disease Control and Prevention, 2021). Newborn hearing screening brochures might play a role in improving those rates if they are accessible or easily understood by parents.
- **Purpose:** To evaluate the suitability of available state-level newborn hearing screening brochures, specifically focusing on design elements, pictures, terminology, and readability.
 - *Study 1:* Evaluation of state-level brochures
 - *Study 2:* Evaluation of pregnant people's understanding of and expected anxiety related to newborn hearing screening result terminology

Study 1: Evaluation of Brochures: Methods

- 59 newborn hearing screening brochures, representing 46 states/territories, were evaluated on four criteria:
 - **Readability:** Written at or below 7th grade level according to the Simple Measure of Gobbledygook (SMOG: McLaughlin, 1969) and Flesch Reading Ease Readability Formula (FRE: Flesch, 1948)
 - **Brochure Design:** Score high on the Medication Information Design Assessment Scale (MIDAS; Krass, Svarstad, & Bultman, 2002)
 - **Pictures:** Include only relevant pictures (e.g., newborn babies, hearing screening equipment) and not include inappropriate pictures (e.g., older children, assistive hearing devices)
 - **Use of "Refer":** Did not use the word "refer" to indicate screening results
- Brochures were assigned a pass/fail score for each of the four criteria to create a summary score from 0-4

Study 1: Evaluation of Brochures: Results

- Only 7 brochures met all four criteria (12%)
- **Readability:** 63% of brochures were written above a 6th grade reading level
 - The average reading level in the United States is 7th or 8th grade (Marchand, March 22, 2017)
- **Brochure Design:** All brochures were missing some important design elements (range of 5-11, out of 13). Only 41% of brochures met the threshold for an acceptable MIDAS score (score of 9) defined in this study.
 - Common non-optimal elements: small margins, too many letters in a single line, lack of summary boxes of key points
- **Pictures:** 27% included inappropriate pictures
 - Most often by including pictures of older babies or toddlers
- **Use of "Refer":** 30% used the word "refer" to indicate screening result

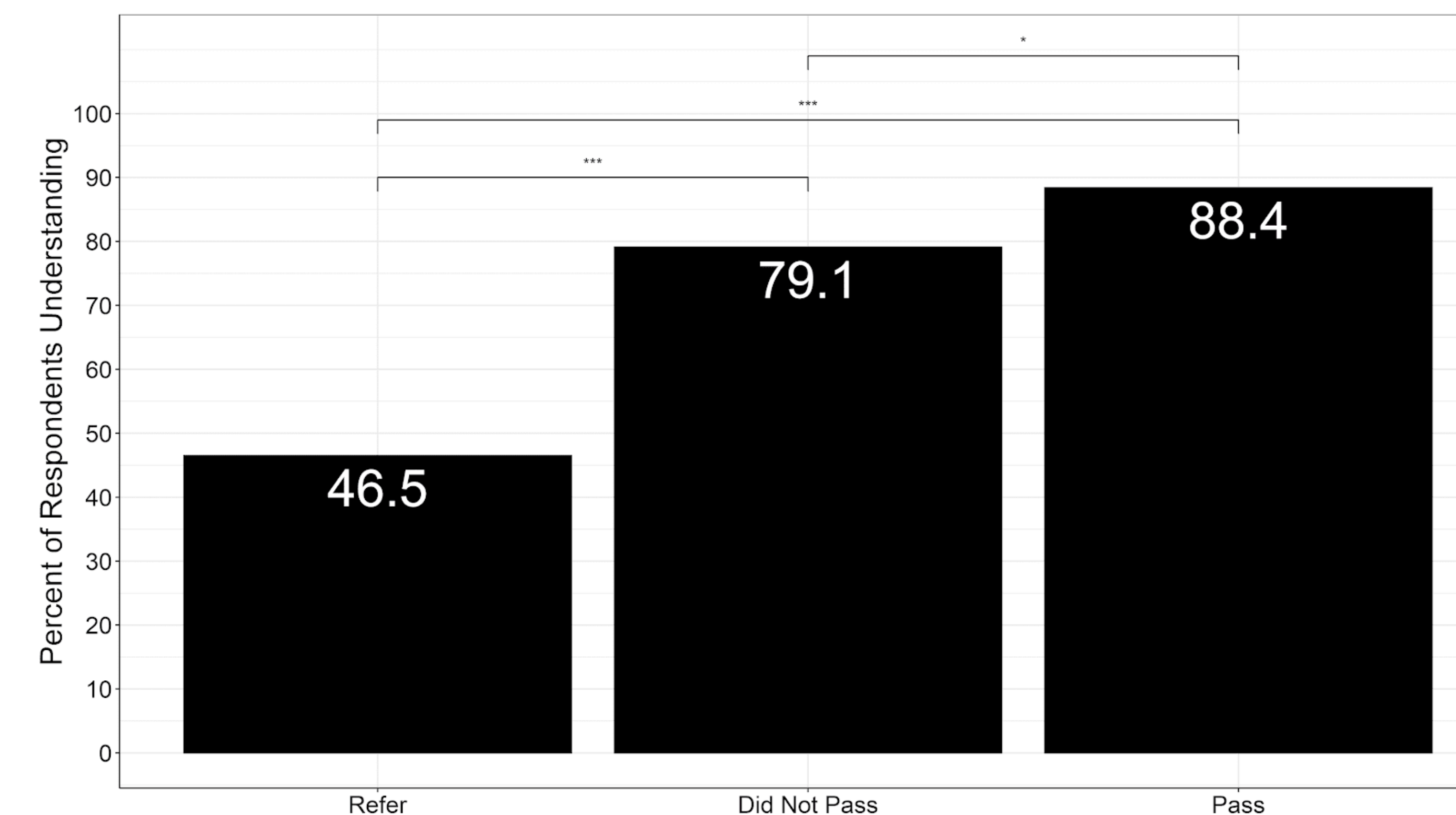


Fig 1. Percent of participants who correctly defined each of the three terms. Note: *** indicates $p < 0.0005$, * indicates $p < 0.05$.

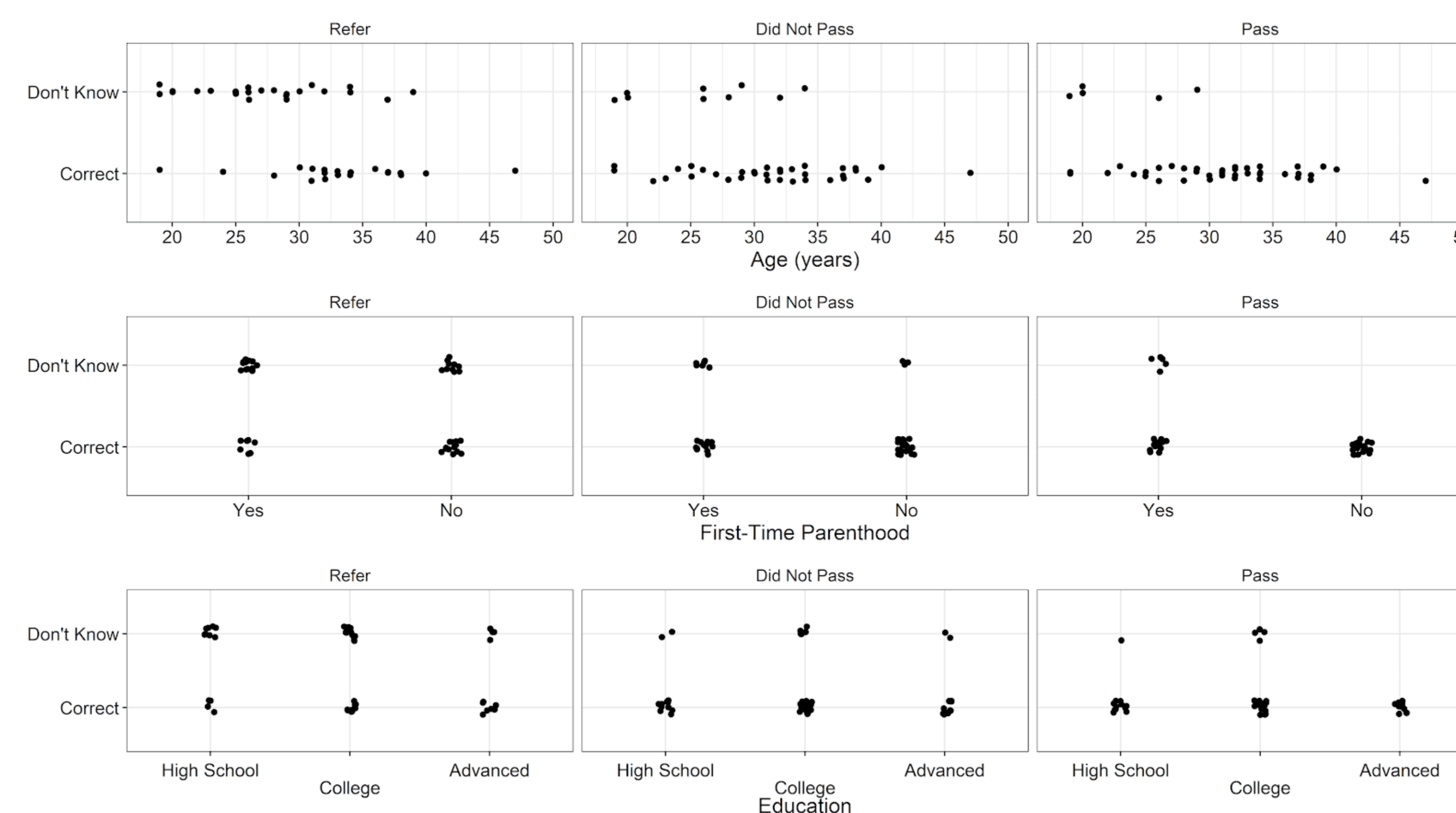


Fig 2. Relationship between whether a participant correctly defined a term and their age, whether they are first time parents, and their highest level of education.

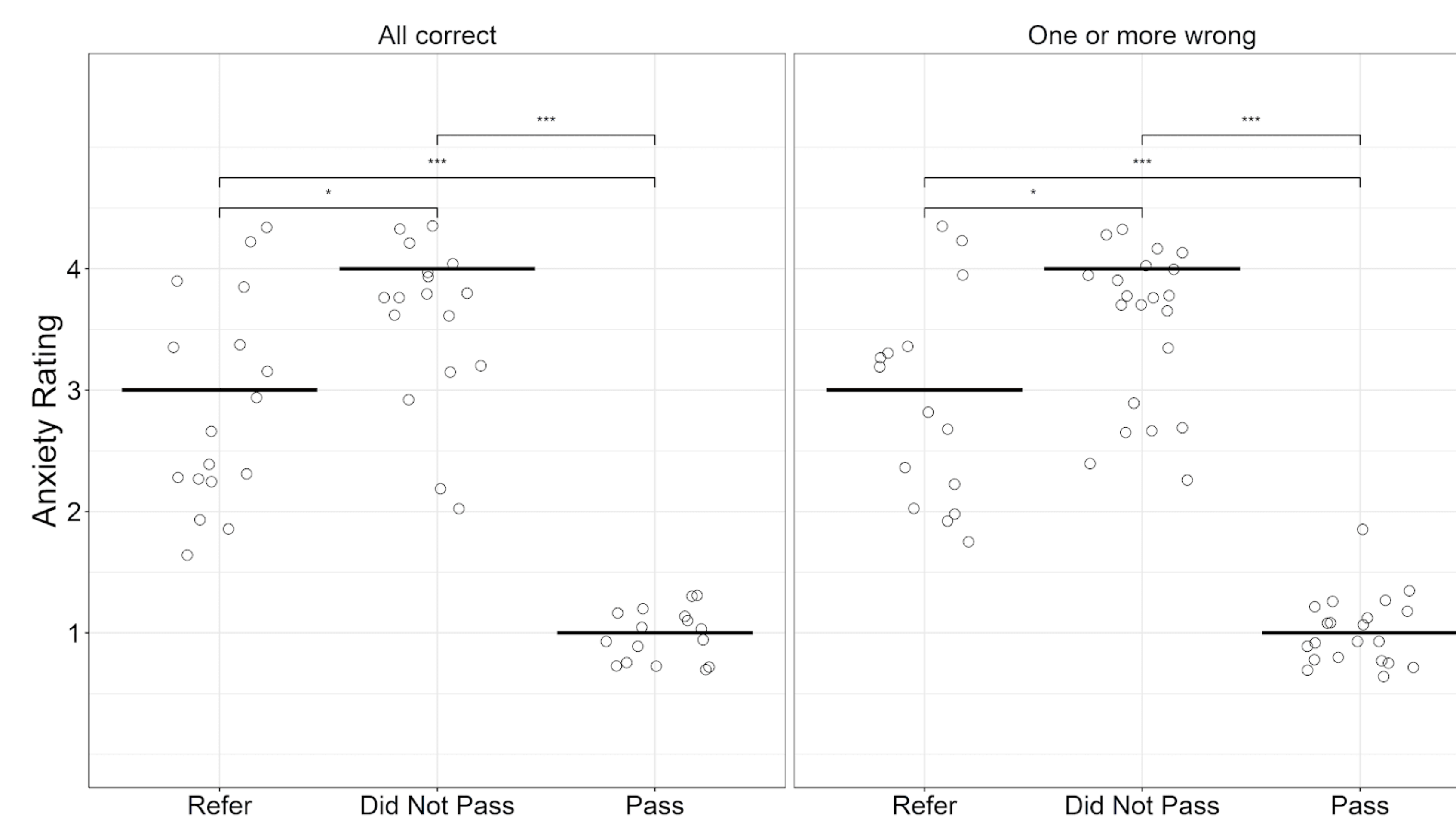


Fig 3. Individual and median self-reported expected anxiety ratings from participants who understood all terms and did not understand at least one term.

Study 2: Understanding 'Refer': Methods

- 43 pregnant people were recruited from a health clinic to complete a questionnaire regarding understanding of and expected anxiety in relation to newborn hearing screening result terminology
 - 10 short-answer and multiple-choice demographic questions
 - 3 questions about understanding the screening result terms ("pass", "did not pass", "refer")
 - 3 questions about self-reported expected anxiety should their newborn receive any of the potential screening results

Study 2: Understanding 'Refer': Results

- Fewer participants understood "refer" (47%) compared to "pass" (88%) and "did not pass" (79%); see Figure 1.
- Parents were not likely to understand the word 'refer' in this context
- Younger participants were less likely to understand the meaning of the word "refer" than older participants; see Figure 2.
- Education level and first-time parenthood did not affect understanding of "refer" result
- Ratings of anxiety were higher in response to the term "did not pass" (median rating = 4 out of 4) than for the term "refer" (median rating = 3 out of 4); see Figure 3.
 - A "refer" result was not likely to induce as high a level of anxiety as the term "did not pass"; however, anxiety has not been linked with healthcare noncompliance and might be related to adherence to healthcare recommendations

Conclusions

- Practitioners should consider readability, design, pictures, and use of the term "refer" when designing newborn hearing screening brochures
- The term "did not pass" should be used as an alternative for the term "refer" in reference to newborn hearing screening results
- Paying close attention to the suitability of educational materials provided to families might contribute to enhanced understanding and improved follow-up with recommendations and increase parent satisfaction with hearing screenings

Key References

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