

Hearing Loss and Cognitive Errors in a Typical Otolaryngology Practice

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Abstract

Introduction: Hearing loss is associated with dementia and cognitive impairment in older adults. This association has not yet been validated within the cohort of a typical otology practice, the results of which would benefit pre-surgical expectation management and patient selection.

Methods: Consecutive adults presenting to an academic otology practice from June 2022 to September 2022 were screened for cognitive dysfunction utilizing the Cognitive Failures Questionnaire (CFQ). Subjects were stratified as having serviceable or non-serviceable hearing through retrospective review of audiograms. Non-serviceable hearing was defined for the worse-hearing ear utilizing the 1995 AAO-HNS Hearing Class D category (speech discrimination score less than 50%). Other demographic factors included history of otologic surgery and surgical candidacy. The primary endpoint was total CFQ score, of which a higher score represents worse cognitive dysfunction.

Results: There were 85 subjects (Figure 1) of which slightly more than half were male (56%) and mean age (SD) was 48.3 (14.4) years; there was no significant difference in age between subjects with or without serviceable hearing, $p = .487$ (Table 1). The median (IQR) CFQ total score was 27.0 (18.0 – 44.0) in 71 subjects with serviceable hearing compared to 20.0 (11.5 – 30.5) in 14 subjects with non-serviceable hearing, $p = .131$ (Figure 2). History of otologic surgery, surgical candidacy, and pure-tone average (PTA) were not significantly associated with CFQ total score (Figure 3).

Conclusions: In contrast to previously established associations between age-related hearing loss and cognitive decline, the present study failed to identify hearing loss as a predictor of poor cognitive dysfunction.

Figure 1. Flowchart of study participants.

CFQ, Cognitive Failures Questionnaire.

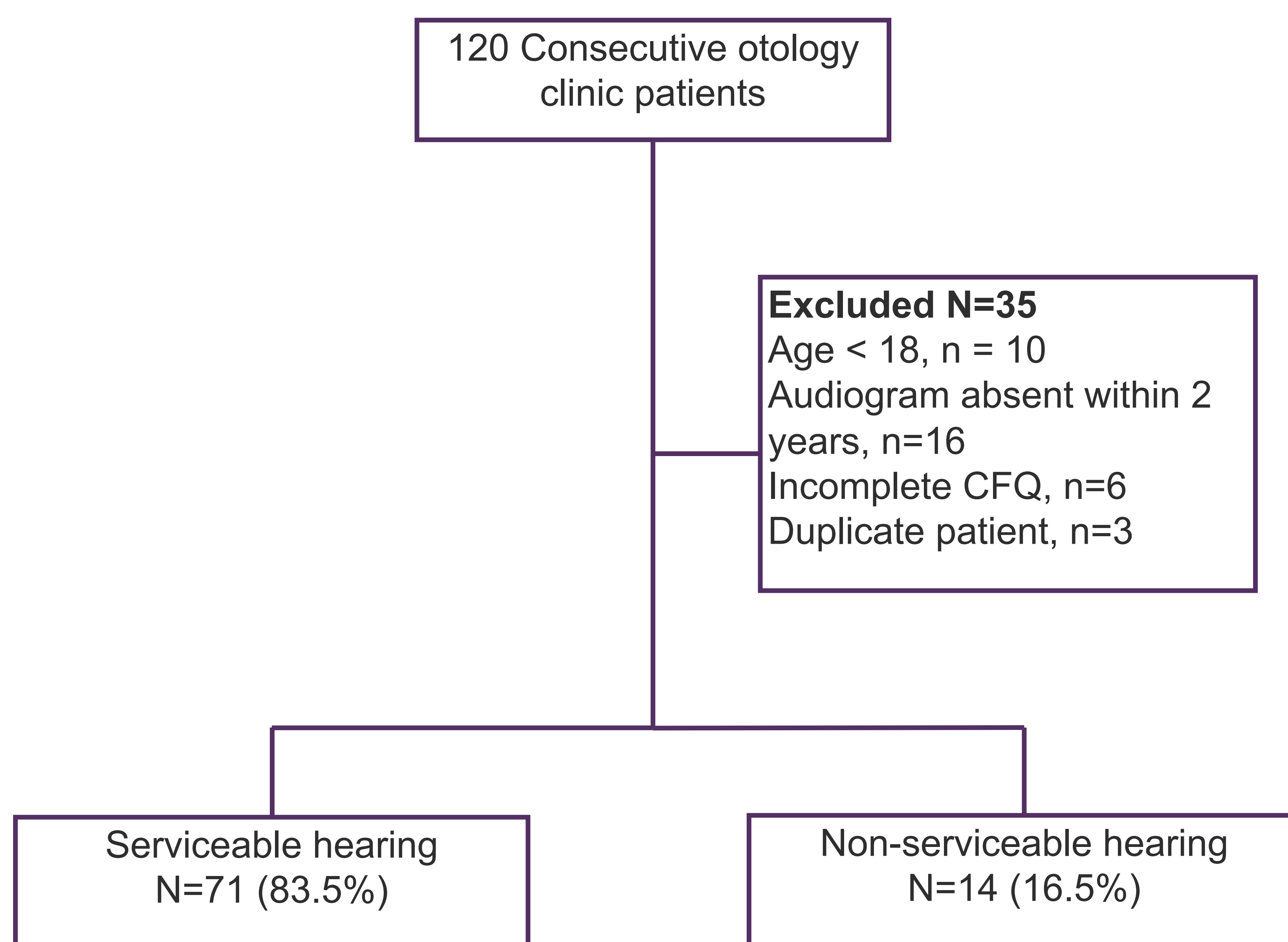


Table 1. Patient Demographics and Characteristics

	Serviceable hearing N=71	Non-serviceable hearing N=14	P-value
Age, y, mean (SD)	47.8 (14.0)	50.7 (16.9)	.487
Median (IQR)	47.0 (38.0 – 58.0)	46.0 (36.0 – 69.0)	
Sex, No. (%)			.570
Male	39 (54.9)	9 (64.3)	
Female	32 (45.1)	5 (35.7)	
History of otologic surgery, No. (%)	27 (38.0)	6 (42.9)	.770
Surgical candidates, No. (%)	11 (15.5)	4 (28.6)	.260
Hearing class, ^a No. (%)			
Class A	41 (57.7)	0 (0.0)	
Class B	26 (36.6)	0 (0.0)	
Class C	4 (5.6)	0 (0.0)	
Class D	0	14 (100.0)	

^a1995 AAO-HNS Hearing Classification System. Class A denotes a pure-tone threshold less than or equal to 30 dB and speech discrimination score greater than or equal to 70%. Class B denotes a pure-tone threshold greater than 30 dB and less than or equal to 50 dB and a speech discrimination score of greater than or equal to 50%. Class C denotes a pure-tone threshold greater than 50 dB and a speech discrimination score greater than or equal to 50%. Class D denotes any pure-tone threshold but speech discrimination score less than 50%.

Cognitive Failures and Hearing Loss

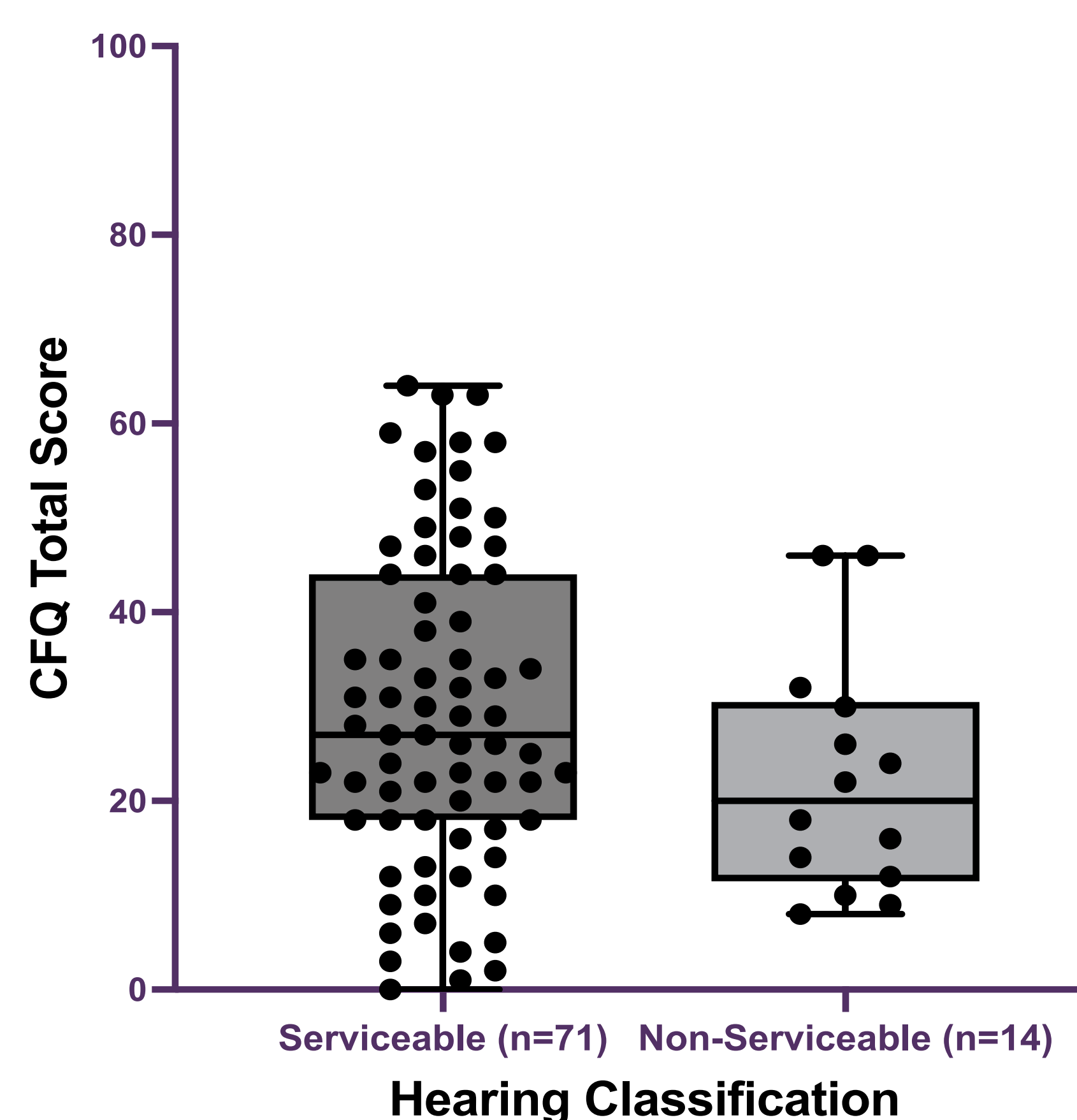


Figure 2. Box plots of cognitive failures questionnaire (CFQ) total scores for patients with serviceable (n=71) compared to non-serviceable hearing (n=14). The median (IQR) CFQ total score was 27.0 (18.0 – 44.0) in subjects with serviceable hearing compared to 20.0 (11.5 – 30.5) in subjects with non-serviceable hearing, $p = .131$.

CFQ and PTA

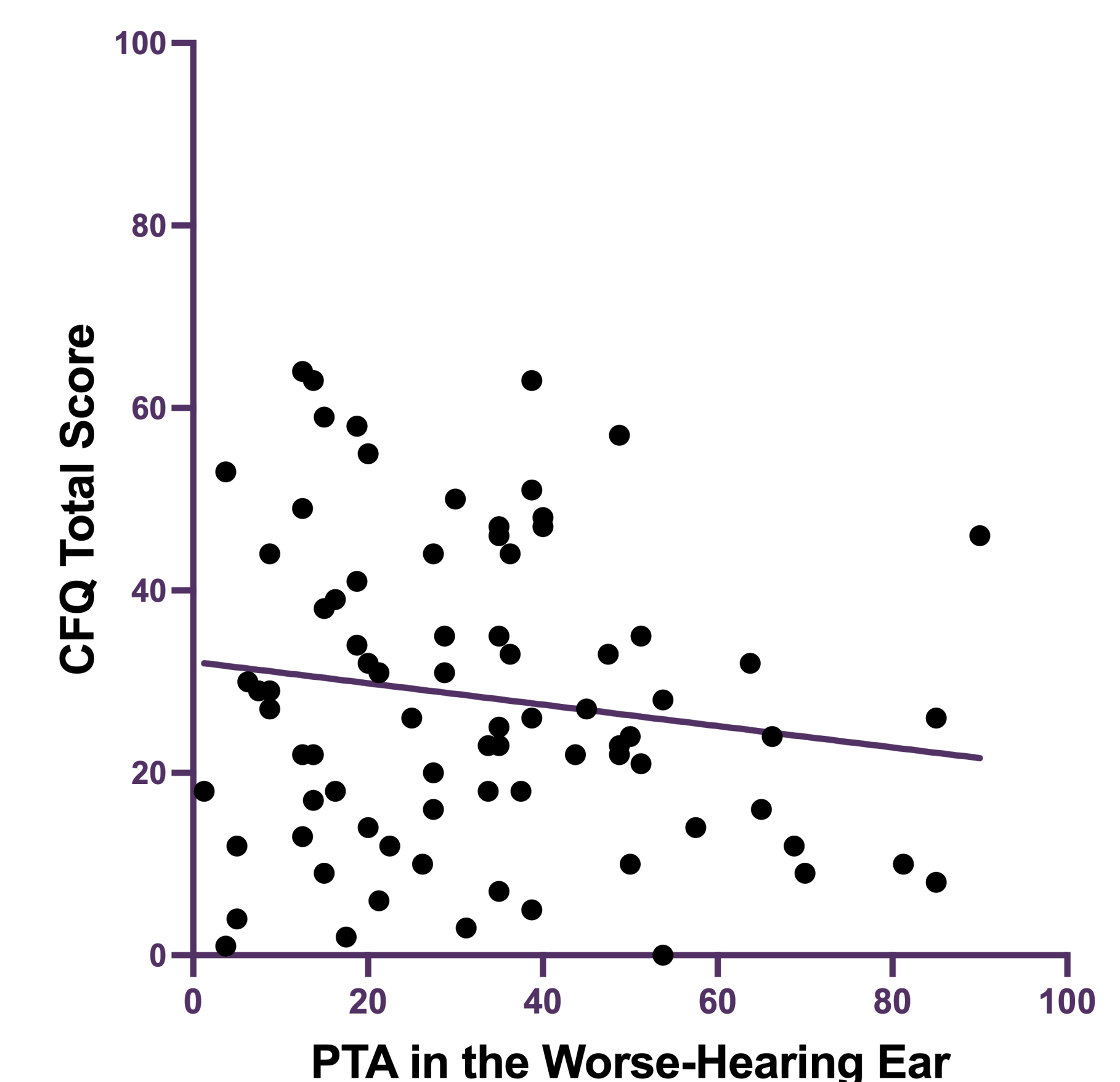


Figure 3. Univariate linear regression of total CFQ scores and pure-tone averages in the worse-hearing ear. $\beta = -0.117$; 95% CI: -0.297 – 0.062; $p = .198$. CFQ, Cognitive Failures Questionnaire. PTA, pure-tone average.

CONCLUSIONS:

- In contrast to the age-related hearing loss literature, in the typical otology practice degree of hearing loss may be a poor predictor of cognitive dysfunction.
- In our study, we showed that in the worse-hearing ear neither non-serviceable hearing classification nor pure-tone average was significantly associated with increased scores on the cognitive failures questionnaire (CFQ).
- Our results suggest that for this patient population, at least subjective perceptions of cognitive performance may be unassociated with degree of hearing loss and remain unimproved even after surgical hearing intervention; further study is warranted to better inform preoperative patient counseling.