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Validation of the English language version of the Quality of Life in People with Hearing Loss Questionnaire (HL-QoL)

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Introduction

The Quality of Life in People with Hearing Loss Questionnaire (HL-QoL) is a specific and standardized tool to measure quality of life in individuals with hearing loss. The German language version of the HL-QoL has been validated in cochlear implant users with MED-EL cochlear implants (Illg et al., 2023). This study aimed to validate the HL-QoL questionnaire in English.

There were two goals for the current study: (1) obtain psychometric measures for the English version of the HL-QoL, and (2) compare the psychometric measures of the English language version with those obtained from the German language version. A secondary objective was to investigate the possible influence of demographic data (e.g., gender, age, and wearing time of the audio processor) on the total score of the HL-QoL.

Materials

The 21-item German language version of the HL-QoL was directly translated into English by a professional translator. This version was proofread by four reviewers who are proficient in English and live in the United States, Canada, Ireland, and South Africa (Table 1).

Table 1. The items of the English version of the HL-QoL questionnaire

1	Do you find it tiring to listen without lipreading in a loud environment or in a large group?
2	Does your hearing impairment cause you difficulties when you are in traffic (e.g. on foot, in a car, on a bicycle)?
3	Does your hearing impair active participation when you are at social gatherings (e.g. restaurants, bars, ceremonies, parties)?
4	Do you find it difficult to follow an everyday phone conversation with a person you don't know (e.g. with a doctor's receptionist, customer service)?
5	Do you feel that your hearing impairs you when communicating in shops or with public spaces (e.g. in official procedures, at insurance companies, at lawyers' offices etc.)?
6	Does your hearing impair you in your everyday activities at home (e.g. housework, caring for relatives, supervising children)?
7	Does your hearing impair you when choosing your leisure activities (e.g. trips, travelling, sports, etc.)?
8	Does your hearing impair interactions with other people (e.g. friends, family, neighbors)?
9	Are you excluded when you are with other people because of your hearing?
10	Do you avoid situations and places where your hearing might impair you?
11	Does your hearing impair you in education or at work?
12	Do you feel uncomfortable in your familiar social environment because of your hearing?
13	Do you feel uncomfortable when talking to people you don't know because of your hearing?
14	Does your hearing reduce your confidence or your self-esteem?
15	Does your hearing make you feel anxious about the future or your future life plans?
16	Do you feel exhausted or tired because of your hearing?
17	Do you find it difficult to adapt your voice or your manner of speaking to different situations (e.g. loud or quiet; happy, sad or angry)?
18	Does your hearing stop you from expressing your wishes and rights (at work, in personal relationships)?
19	Do you feel that other people don't take you seriously because of your hearing?
20	Do you feel that you often mishear things in everyday life, resulting in misunderstandings, because of your hearing?
21	Do you feel that you have difficulties concentrating and remembering because of your hearing?

Each answered item was assigned a numerical value from 1 to 7 points (Table 2). A total score is calculated if at least 19 items are answered. Therefore, the total score ranges from 19 to 147 points.

Table 2. Scoring value per response type

≤ 5% (never)	20% (very rarely)	35% (rarely)	50% (regularly)	65% (often)	80% (very often)	≥95% (always)	not applicable
7	6	5	4	3	2	1	0

Methods

Ninety-seven participants (39 female, 58 male, 0 diverse) with a mean age of 61 yrs (standard deviation = ±13 yrs; range: 21-83 yrs) completed the English version of the HL-QoL and were included in the analyses (Table 3).

Table 3. Summary of demographic information for research participants

	n
No. of participants	97
Gender	
Female	39
Male	58
Diverse	0
Hearing Configuration by HL	
Bilateral HL	76
Bilateral CI+CI/EAS+EAS	34
Unilateral CI/EAS	19
Bimodal CI+HA	23
Unilateral HL	21
Unilateral CI or EAS	21
Age	yrs
mean	61.3
SD	13.2
minimum	21
median	65
maximum	83
Years since first CI	yrs
mean	8.0
SD	5.6
minimum	0
median	7
maximum	26

Figure 1. Research participant hearing configurations

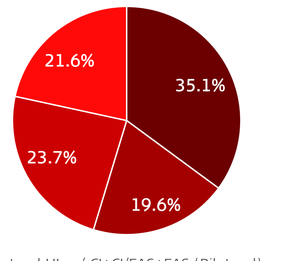
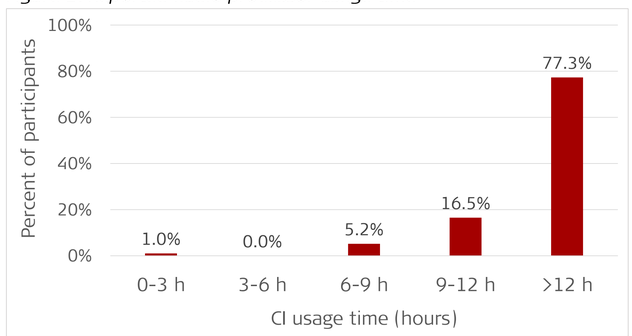


Figure 2. Reported audio processor usage time

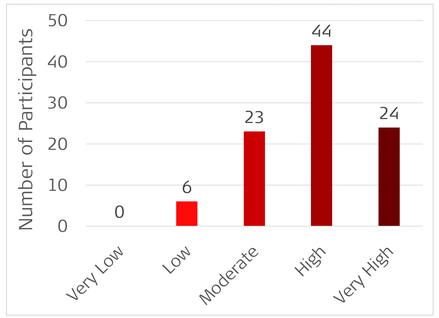


For bilateral participants, the longest reported CI usage time is used in Figure 2.

Results

The mean total HL-QoL score of the 97 fully-completed questionnaires was 103 points (±SD 23, range 47-147). The total score was divided into five categories: very low, low, moderate, high, and very high self-perceived QoL benefit (Figure 3).

Figure 3. HL-QoL total scores by category



Item Analysis

- Participants used the full range of answer options; the questionnaire had a slight ceiling effect, with the following questionnaire items having a high response rate in the top score of the 7-point Likert scale: **6** (33.0%), **12** (32.0%); **14** (29.9%), **15** (36.1%), **17** (34.0%), **18** (44.3%), **19** (32.2%) and **21** (29.9%). No floor effects were observed. Note that equal answers for all levels would be 15% per level.
- The item difficulty index ranged from **0.39** to **0.84** (a difficulty index between p = 0.3 and p = 0.9 is deemed to be satisfactory).

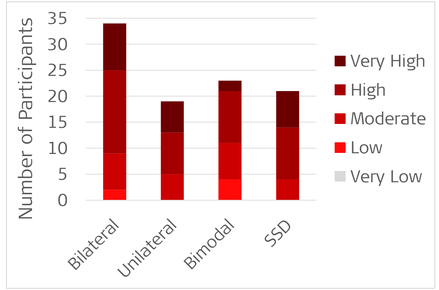
Reliability

- The questionnaire reached a good reliability with a Cronbach`s α = **0.941** indicating a very high internal consistency, and a Guttman`s split-half-coefficient = **0.872** indicating high construct consistency.

Validity

- Results of the KMO test (Kaiser & Rice, 1974; **0.891**) and the Bartlett test of sphericity (χ^2 **= 1468.84, df = 210, p < 0.001**) confirmed the procedure of an exploratory factor analysis. Factor analysis confirmed the two-factor solution of the original German version of the HL-QoL, which explained 56.67% of the total variance.

Figure 4. Total scores by hearing configuration



Discussion and Conclusion

The mean total HL-QoL score (103/147) suggests an overall high quality of life benefit in our sample of individuals with hearing loss using at least one cochlear implant. Results of the item and reliability analyses suggest that the English version of the HL-QoL is a valid tool that provides a holistic perspective on how hearing loss can impact an individual's quality of life.

With the HL-QoL now validated in both German and English, it is more accessible to clinicians and researchers worldwide.

Illg, A., Amann, E., Koinig, K. A., Anderson, I., Lenarz, T., & Billinger-Finke, M. (2023). A holistic perspective on hearing loss: first quality-of-life questionnaire (HL-QOL) for people with hearing loss based on the international classification of functioning, disability, and health. *Frontiers in Audiology and Otology*, *1*, 1207220.

Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational and psychological measurement*, *34*(1), 111-117.