International Journal of Speech and Audiology

E-ISSN: 2710-3854
P-ISSN: 2710-3846
IJSA 2024; 5(1): 32-35

www.rehabilitationjournals.com/speech-and-audiology-journal
Received: 07-01-2024
Accepted: 10-02-2024

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Translation and validation of APHAB (Gujarati Version) for evaluating hearing aid benefit in adults

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Abstract
The study was designed to assess the Hearing aid benefit in Gujarati speaking adults via administration of the APHAB (Gujarati version) Questionnaire. The present study aimed to translate and validate an Abbreviated Profile of Hearing Aid Benefit - Gujarati Version from the original Abbreviated profile of hearing aid benefit (English) to measure hearing aid benefit in Gujarati adult hearing aid users. The study was conducted in 3 different phases: Phase I - Translation of APHAB Questionnaire in the Gujarati language; Phase II - Validation of the translated questionnaire; Phase III - Administration of the validated Questionnaire. The validation of the questionnaire was done using three-point Likert scale (1-inappropriate, 2-somewhat appropriate, 3-more appropriate). The final translated and validated Abbreviated Profile of Hearing Aid Benefit (APHAB) in Gujarati version was administered utilizing a google form on 30 adult hearing aid users aged 18 to 60 years (10 females & 20 males) from respected hearing aid centers in Ahmedabad, Gujarat, as well as from various other clinics around Gujarat. The current study's findings reveal that the participants' performance is more significant with the hearing aid compared to those without hearing aid condition. The overall results from the current study using the APHAB (Gujarati Version) suggests a significant benefit with the hearing aid condition compared to without hearing aid condition in all the domains (ease of communication, reverberation, background noise & averseness) in Gujarati adults.

Keywords: APHAB (Gujarati Version), hearing aid benefit, translation, validation, subjective scale for benefit

Introduction
The World Health Organization (WHO, 1948) defines health as being physically, psychologically, as well as socially well-adjusted and free of illness and disability. The latter are seen as significant lifestyle behaviors in medical practice and research. According to the World Health Organization (2021) more than five percent of the people worldwide, or 430 million individuals, require rehabilitation to address "disabling" hearing damage (There are 4.5 million children). It has been predicted that by 2050, more than seven hundred million individuals, or one in ten, will have significant hearing loss. Hearing loss has been demonstrated to contribute considerably to the worldwide illness burden in individuals, families, societies, and governments.

Amplification is the first and most significant stage in the auditory rehabilitation program. The primary method in the rehabilitation program is a listening device (Alpiner & McCarthy, 2000) [1]. As per fitting (1998) [8] hearing aid fitting procedure consists of six primary phases: evaluation, treatment management, choosing the hearing aid, validation, orientation, and validation. The evaluation stage is critical for determining the type and severity of deafness, and it aids in deciding amplification candidacy and planning the intervention program.

The severity or degree of change from unaided to aided listening is expressed as a benefit. It is generally determined as a project rather than a percentage or proportion. It can be pleasant, harmful, or unbiased, based on how the hearing aid affects performance (Humes, 1999) [10]. According to Humes (1999) [10], objective benefit criteria include modifications in speech recognition scores associated with hearing aid use and real-ear insertion gain (REIG = REAR - REUR). To determine the impact of the hearing aid, testing conditions in the aided and unaided conditions must be identical.

Subjective measurements of benefit are also available. Acceptance of subjective evaluation of the effectiveness of a hearing aid fitting as a crucial aspect of the hearing aid fitting is growing (McCarthy, 1996; Muller, 1998) [11, 12] Hearing aid users, for example, can make sound-quality ratings for a range of stimuli with and without their hearing aids to enhance

sound quality in the aided state. Hearing handicap may be measured before and after using hearing aids, with the difference representing the subjective improvement or changes that occur in self-perceived impairment. In this context, the Hearing Handicap Inventory for the Elderly (HHIE; Ventry & Weinstein, 1982) [16] has been effective. The importance of integrating patient self-reports with technical and analytical data is demonstrated by Bentler & Kramer, (2000) [2].

According to Palmer & Muller (1998) [12], audiologists should ask patients to judge their own satisfaction with hearing device benefits. This should be a standard element of each hearing aid fitting. The difference serves as a subjective measure of benefit. The Profile of Hearing Aid Benefit (PHAB; Cox *et al*., 1991) [7] and, more subsequently, the APHAB (Cox & Alexander, 1995) [5] have been effective in this respect. In this technique, unassisted and aided performance are either measured twice in time (before and after a period of hearing aid use) or at one moment after hearing aid use. Still, the user must recollect how he or she performed without the hearing aid in that same listening scenario before attending aid usage.

Methods

The current study sought to ascertain the translation and validation of the Abbreviated Profile of Hearing Aid Benefit - Gujarati Version from the original Abbreviated profile of hearing aid benefit (English) to measure hearing aid benefit in Gujarati adult hearing aid users.

Research Design

A descriptive study used to validate the hearing aid benefit using APHAB (Gujarati version). A comparison between with and without hearing aid was employed to compare the hearing aid benefit. The study was carried out entirely through online mode.

Participants

A total of 30 participants who were Hearing Aid users and native Gujarati speakers were recruited for the study. The Questionnaire was administered on all the 30 participants.

Inclusion criteria

Participants were having pure tone unaided threshold ranged from mild to severe sensorineural hearing loss (in frequencies between 250 Hz and 8000 Hz).

Participants were having aided pure tone threshold within the speech spectrum (in frequencies between 250 Hz and 4000 Hz).

Participants who are newly fitted with a Digital hearing aid and with prior 2-3 years of amplification experience ware selected.

Participants who were not having any otologic and neurologic history.

Procedure

Phase I: Translation of APHAB Questionnaire in the Gujarati language

The first phase involved translating the Abbreviated profile of hearing aid benefit, available in English, into the Gujarati language. The Abbreviated Profile of Hearing Aid Benefit was translated using the well-accepted American Academy of Orthopedic Surgery (AAOS, 2000) guidelines that included the forward-backward translation process. The following five steps were included:

Forward translation-test material available in English was translated into Gujarati by two professional experts

Synthesizing popular translation-from two different translation version by two professional experts made a single combined version

Backward translation-approved Gujarati version is translated into English to determine conceptual equivalence to the original version

Analysis by the expert committee-experts such as experience ASLPs compare and evaluate both the transitions

Phase II: Content Validation of the Abbreviated profile of hearing aid benefit (Gujarati version) Questionnaire

Professional audiologists, content validation methods were conducted for the validation of the questionnaire. For the content validation, the professional audiologists were asked to rate the question on a three-point (1 to 3) Likert rating scale, where rating one indicated an inappropriate statement, rating two indicated a somewhat appropriate statement, and rating three indicated more appropriate statements. After the completion of the validation methods, the translated questionnaire was finalized.

The final questionnaire was designed for all the participants were instructed to carefully read and answer all the questions. The final questionnaire that was prepared using the inputs obtained from the content validation.

Phase 3: Administration of the Questionnaire

This questionnaire was designed exclusively for Gujarati adult hearing aid users with daily hearing aid usage benefit assessment. Responses were gathered for two to three months and kept completely confidential. The hearing aid users were selected through personal contacts and from various clinics and the hospitals. Each participant was instructed to review an informed consent letter and agree to the survey's terms and conditions.

Statistical analysis

The responses were examined, and analyze for all the six domains of the questionnaire. All analyses within the questionnaire were conducted in Microsoft Excel and SPSS v.25 software. Descriptive statistics were employed to analyze the response data. Percentages, frequency, graphs, and tables were used to summaries the categorical variables in the questionnaires.

Results and Discussions

The data's normality was assessed using the Shapiro-Wilk test, and the results showed that the data was not normally distributed ($p<0.05$). Hence, a Wilcoxon Sign Rank test was administered for further analysis. Mean, Median, Standard Deviation (SD), and 95% confidence interval for mean were obtained for each domain of the questionnaire using descriptive statistics. Figure 1 represent the APHAB scores of all the participants.

Figure 1 reveals the average mean and median scores of 24 questions in those with hearing aid conditions were found to be higher than those without hearing aid conditions. It can be concluded that the performance of individuals with hearing aid users were better compared to those without using hearing aids. The findings reveal a substantial difference in mean scores between hearing aid-free and hearing aid-conditions, demonstrating a measurable benefit

of using hearing aids. As a result, the study's findings showed that individuals could accurately evaluate their hearing aid benefits using the APHAB (Gujarati Version).

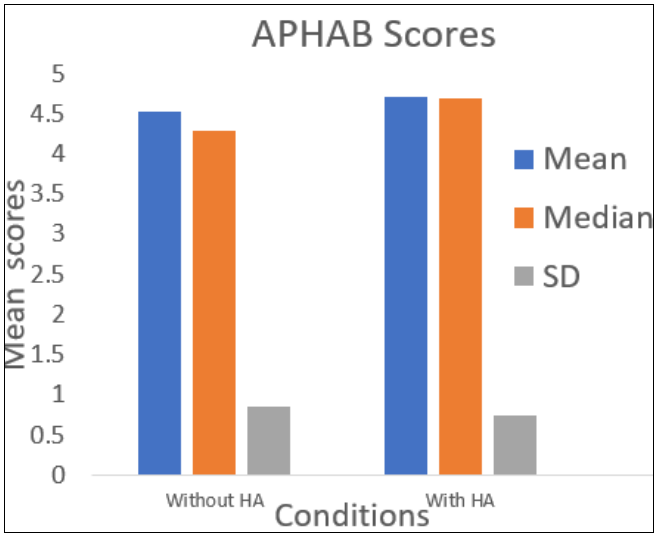

Fig 1: Average Mean, Median, and standard deviation scores of questionnaires (24 questions) for with and without hearing aid and condition

Similar results were documented by (Cox, 1997) [4] for twenty-two older persons who received their earliest hearing aids. The participants completed the Abbreviated Profile of Hearing Aid Benefit after wearing their hearing aids for three months (APHAB). All the participants (N=22) showed a substantial overall advantage with amplification.

Among the 45 participants' 30 participants whose responses were considered; the duration of the hearing aid use varied considerably among 30 participants, two participant (7%) was using the hearing aid for less than six weeks because he was newly fitted hearing aid user. Whereas 05 participants (17%) were using the hearing aid for six weeks to 11 months (6.7%). About 13 participants (43%) were using their hearing aids for a duration between 1-10 years. 33% of the participants have been using a hearing aid for over ten years. The current study results are supported by (Cox, 2003) [6] who has stated that the hearing device's outcome duration indicates real-world hearing aid outcome.

According to data published by (Saunders & Jutai, 2004) [13], there is a substantial correlation between lifetime hearing aid usage (>10 years) and daily use, which means that with time, people gradually utilize their hearing aids more frequently. That is hearing aid usage helps the individual to deal with the worse listening settings and hence pushing him to wear it for longer duration.

The results reveals that the mean scores obtained for most of the questions in all the 4 domains: Ease of communication, reverberation, background noise and averseness was found to be better with hearing aid condition compared to without hearing aid condition. Hence, for assessing statistically significant for four domains with and without hearing aid conditions Wilcoxon Sign Rank test was carried out. The results revealed a statistically significant difference in APHAB (Gujarati Version) scores between the two conditions with and without hearing aid ($Z= 2.088$, $p= 0.037$; $p< 0.05$) that the APHAB (Gujarati Version). The results obtained in the current study is supported by various research that has showed that digital hearing aid users benefited more favorably from their devices in noisy or distracting environments, which were more challenging to hear.

The APHAB - (Gujarati version) got maximum of more appropriate response form validators on the Likert scale, which indicates higher content validity of the questionnaire as a clinical tool. The results obtained from the current study indicates has been supported by (Stelmachowicz, 1999) [14] and (Harrison *et al*., 2003) [9] who has indicated that the importance of combining subjective and objective evaluations while assessing the effectiveness of a hearing aid as well as cochlear implant in children and is becoming more widely acknowledged. Also, it has been evidenced that using hearing aids is found to have a significant long-term subjective advantages and satisfaction (Takahashi *et al*., 2007) [15].

Conclusion

Hearing is highly crucial when it comes to the rehabilitation of people with hearing impairment. Similarly, the degree of benefit experienced when using a hearing aid is just as crucial as proper fitting and use. Based on the current study's findings, it can be concluded that the translated and validated hearing aid benefit questionnaire is a crucial instrument for evaluating the benefits of hearing aids in adults.

The current study's findings reveal that there was better mean scores obtained in all the 4 domains (ease of communication, reverberation, background noise & averseness) in hearing aid condition compared to without hearing aid condition. Participants benefitted in the scenario, such as ease of communication and aversive condition, which directly correlates with higher satisfaction with using a hearing aid. The APHAB allow audiologists to concentrate on improving their patients' hearing status depending on the individual domains and can be used for fine tuning of hearing aids as well as providing guidelines for constructing a hearing aid programs, which is major benefit of subjective evaluation.

References

1. Alpiner JG, McCarthy PA (Eds.). Rehabilitative audiology: Children and adults. Lippincott Williams & Wilkins; c2000.
2. Bentler R, Wu YH, Kettel J, Hurtig R. Digital noise reduction: Outcomes from laboratory and field studies. Int J Audiol. 2008;47(8):447-60.
3. Census of India; c2011.
4. Cox RM. Administration and application of the APHAB. The Hearing Journal. 1997;50(4):32-35.
5. Cox RM, Alexander GC. The abbreviated profile of hearing aid benefit. Ear Hear. 1995;16(2):176-186.
6. Cox RM, Alexander GC, Beyer CM. Norms for the international outcome inventory for hearing aids. J Am Acad Audiol. 2003;14(08):403-413.
7. Cox RM, Gilmore C, Alexander GC. Comparison of two questionnaires for patient-assessed hearing aid benefit. J Am Acad Audiol; c1991. p. 2.
8. Fitting AAHConH. Guidelines for hearing aid fitting for adults. Am J Audiol. 1998;7(1):5-13.
9. Harrison M, Roush J, Wallace J. Trends in age of identification and intervention in infants with hearing loss. Ear Hear. 2003;24(1):89-95. https://doi.org/10.1097/01.AUD.0000051749.40991.1F

10. Humes LE. Dimensions of hearing aid outcome. J Am Acad Audiol. 1999;10(01):26-39.
11. McCarthy P. Hearing aid fitting and audiology rehabilitation: A complementary relationship. Am J Audiol. 1996;5(2):24-28.
12. Muller HG, Palmer Cv. The profile of aided loudness: A new "PAL" for '98: The Hearing Journal. 1998;51(1):10-19. https://journals.lww.com/thehearingjournal/Citation/1998/01000/The_Profile_of_Aided_Loudness__A_new__PAL__for.1.aspx
13. Saunders GH, Jutai JW. Hearing specific and generic measures of the psychosocial impact of hearing aids. J Am Acad Audiol. 2004;15(03):238-248.
14. Stelmachowicz PG. Hearing aid outcome measures for children. J Am Acad Audiol. 1999;10(1):14-25. https://doi.org/10.1055/S-0042-1748327/BIB
15. Takahashi G, Martinez CD, Beamer S, Bridges J, Noffsinger D, Sugiura K, *et al*. Subjective measures of hearing aid benefit and satisfaction in the NIDCD/VA follow-up study. J Am Acad Audiol. 2007;18(04):323-349.
16. Ventry IM, Weinstein BE. The hearing handicap inventory for the elderly: A new tool. Ear Hear. 1982;3(3):128-134.
17. Weinstein BE. Outcome measures in the hearing aid fitting/selection process. Trends Amplif. 1997;2(4):117-137.