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Satisfaction with Amplification in Daily Life (SADL) questionnaire in Hindi: a survey report on evaluating the benefit with amplification

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Abstract

Background: The present study aimed to translate the Satisfaction with Amplification in Daily Life (SADL) questionnaire into Hindi. The translated questionnaire was administered to 80 Hindi-speaking individuals with hearing impairment.

Results: A good reliability was found in the questions using the Cronbach alpha test. The Pearson *r* correlation revealed a significant positive correlation between the degree of hearing loss and the global satisfaction scores. It suggests that there is a direct proportion of degree of hearing loss and global scores as the user has severe hearing loss the communication difficulty is also great in magnitude.

Conclusion: From the findings of the current study, it can be inferred that the Hindi translation of the SADL questionnaire can be used in clinical settings to measure the hearing aid/s outcome after fitting.

Keywords: SADL Hindi, Hindi questionnaire, Hearing aid benefit, Hearing loss

Background

Hearing loss is reported as a common disorder among adults and older adults [1], as neither the structure nor function of the human system remains static from birth through senescence [2]. Various difficulties are known to be associated with hearing loss, such as decreased audibility, decreased dynamic range, decreased frequency resolution, and decreased temporal resolution [3]. There are also some psychological aspects of hearing loss apart from reduction in speech intelligibility. These psychological disorders comprise frustration, withdrawal, aggression, forgetfulness, depression, and dependence. This provokes the individual with hearing loss to withdraw from any social situations. In the majority of cases, hearing aids are recommended as the first line of treatment to assist communication [4].

The perceived benefits from the hearing aids are reported to vary from person to person [5]. As hearing aids fail to restore the normal perception of sound, the majority of people who wear hearing aids continue to suffer from the psychological effects of hearing loss [6]. Hence, there is a need for a comprehensive rehabilitative intervention. Accompanying with amplification, there is a need for continued support and education to optimize benefits. Even after careful selection of appropriate amplification, rejection and dissatisfaction are present in hearing aid users. Hence, the satisfaction measures have to be implemented. In audiological rehabilitation settings, outcome measures have emerged as an effective method for determining whether or not particular interventions such as hearing aids are working to attain positive results for clients [7]. Although objective outcome measures of hearing aid benefit, such as aided versus unaided speech recognition scores, insertion gain are important for documenting the improvement in a client's hearing ability resulting from hearing aids (i.e.,

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verification), the clients can solely determine the benefit from hearing aids in day to day life [8].

The self-report measures are the standard questionnaires that directly assess benefits like Hearing Aid Performance Inventory (HAPI), standard questionnaire that compares handicap or disabilities before and after rehabilitation like Abbreviated Profile of Hearing Aid Benefit (APHAB), and individualized questionnaires that directly assess benefits like Client Oriented Scale of Improvement (COSI). The questionnaire used in the current study is Satisfaction with Amplification in Daily Life (SADL). This questionnaire is a self-reported measure originally developed by Cox and Alexander [7]. In this questionnaire, the benefit is typically referred to as the improvement in a client's ability to communicate with others and/or carry out everyday activities. Additionally, it measures the reduction in the psychosocial impact caused by hearing impairment following amplification and/or aural rehabilitation [7]. It assesses the multidimensional nature of satisfaction. The scale consists of 15 questions related to aspects of hearing aid use and provides a global score indicating overall satisfaction, as well as four subscale scores consisting of satisfaction in the areas of "Positive Effect" (improved psychoacoustic and psychological functioning), "Service and Cost" (value for money, confidence in provider), "Negative Features" (undesirable effects of hearing aids including background noise and feedback), and "Personal Image" (appearance and stigma).

The respondents are required to indicate their level of satisfaction on a scale of 1 to 7 indicating not at all tremendously satisfied, respectively. The test was then found to have good construct validity and test-retest reliability on test-retest correlation coefficient ($r = 0.81$). However, even though a client may demonstrate quantifiable benefit from hearing aids, such as improved ability to hear other's speech, this does not ensure that the client is fully satisfied with the overall service received, nor does it guarantee that the client considers the hearing aid purchase to be worthwhile as stated by Cox and Alexander [9]. The client satisfaction studies conducted by Kochkin [10] showed that a client's overall satisfaction with hearing aids was strongly linked with the likelihood of repurchasing a particular brand of hearing aid, recommending hearing aids to friends and relatives, recommending a particular clinician or dispenser to others, and general quality of life ratings.

There is a need to measure the hearing aid outcomes which in turn improve the quality of the life of a person with hearing impairment in the Indian population [11]. SADL is a valid clinical tool to measure satisfaction, and it provides the results in terms of global and other subscales such as Positive Effects, Negative Features, Service and Cost, and Personal Image. All these subscales are important in providing satisfaction and dissatisfaction regarding the various aspects of hearing aid(s). So, there is a need to evaluate the satisfaction of listening from hearing aids on the SADL scale concerning the Indian population. To the researcher's knowledge, no such study is done in the Indian context concerning measuring the hearing aid(s) satisfaction using the SADL questionnaire. The study aimed to determine the relationship between the degrees of hearing loss on the satisfaction with hearing aid(s) using the Hindi translation of Satisfaction with Amplification in Daily Life (SADL) questionnaire. The primary objective of the present study was to develop a subjective questionnaire for hearing aid benefits in the Hindi language. The secondary objective is to establish a relation between the degree of hearing loss, hearing aid style [behind-the-ear (BTE), receiver-in-the-canal (RIC), completely-in-the-canal (CIC)], and satisfaction on the translated SADL questionnaire.

Method

A survey was carried out on 80 subjects in the age range of 30 to 60 years ($M = 52.56$ years, $SD = 8.25$). There were 49 males and 31 females. The participants were recruited using purposive sampling. All the participants had a minimum of 6 months experience of in using amplification. The Four Frequencies Pure Tone Average (FFPTA) ranging from mild to profound sensorineural hearing loss in the better ear was used. The participants also had minimum literacy of the 10th standard. Additionally, the participants suffering from any sensory and motor deficits other than hearing loss, congenital hearing impairment, and conductive and mixed hearing loss were excluded from the study. The pure tone audiometry, tympanometry, and hearing aid trial were done using a standard protocol. There were 68 participants with binaural, and 12 participants had monaural hearing aid fitting.

The questionnaire consisted of two parts—(a) the global scale and (b) four subscales such as Positive Effect, Personal Image, Service and Cost, and Negative Features. The global score is the overall satisfaction score whereas subscales are divided into different items of the SADL. The questionnaire has positive and negative effect subscales of which 1, 3, 5, 6, 9, and 10 were positive. For positively geared questions (e.g., item 8: How content are you with the appearance of your hearing aids?), a higher score will be indicative of greater satisfaction (Cox and Alexander, 1999). However, for negatively geared questions (e.g., items 2, 4, 7, and 13), a higher score indicates less satisfaction, but these scores were reversed (explained in the next paragraph) during the time of calculation. So, the higher scores indicate higher satisfaction.

The questionnaire was given to the participants and they were asked to rate their experience on a 7-point Likert scale. The seven points were A—not at all, B—a little, C—somewhat, D—medium, E—considerably, F—greatly, and G—tremendously benefited with hearing aids. A score of 1 to 7 was given from A to G, respectively. For the positive questions 1 point was given to A—not at all, and 7 points were given for G—tremendously benefitted. However, for the negatively framed questions, the scale was reversed by giving 7 points to A—not at all, and 1 point was given for G—tremendously benefitted. The service and cost subscale is made up of 3 items (12, 14, 15) of the SADL. Negative features are comprised of three items such as items 2 (reversed), 7 (reversed), and 11 of the SADL. The personal image subscale is comprised of items 4 (reversed), 8, and 13 (reversed) of the SADL questionnaire. The study was carried out in two phases that include the following.

Phase I

Phase I is the adaptation of the tool—SADL questionnaire. The SADL questionnaire was developed in the English language by Cox and Alexander [7]. The translation of the questionnaire was done in the Hindi language. The questionnaire was subjected to reverse translation by two individuals with equal proficiency in both languages. Further validation of the constructed questionnaire had been done by giving it to the 10 audiologists and speech-language pathologists and 2 linguists with a minimum of 5 years of experience in the field.

Phase II

Participants were asked to rate their responses after reading the questions. The rating was done to each question using the same seven-point Likert scale by the participants. On this scale, higher scores are indicative of greater satisfaction. The collected data were further analyzed using the IBM creation Statistical Package for the Social Sciences (SPSS, version 21, IBM Corporation, NY).

Result

The Cronbach's alpha reliability test ($r = 0.85$) was suggestive of good reliability. The descriptive statistics were performed on the raw data given in Table 1 and Table 2. The inferential statistics were performed using Pearson's correlation, as the data followed the normal distribution. It was carried out to determine the relationship between the degree of hearing loss (better ear FFPTA) and SADL Global scores. There was a significant positive correlation observed between the two given in Fig. 1 ($r\,[80] = 0.023$, $p < 0.05$).

Table 1 Mean of the SADL satisfaction score obtained by the participants based on their perceived difficulty in hearing without hearing aids

Hearing difficulty scale	N	Mean	SD
None	2	48.50	0.707
Mild	9	59.78	1.563
Moderate	40	70.10	5.555
Severe	29	75.72	5.384

Table 2 Mean satisfaction score obtained by the participants on SADL subscales

Subscales	N	Mean	SD
Positive Effect	80	29.70	4.555
Service and Cost	80	13.75	2.457
Personal Image	80	14.10	1.790
Negative Features	80	12.91	2.999

Discussion

A significant positive correlation was noted between SADL Global scores and degree of hearing loss ($r = 0.837$). This positive correlation indicates that participants' satisfaction is strongly associated with the degree of hearing loss. It states that participants with greater hearing loss were more satisfied than those participants with minimal hearing loss. These findings were also consistent with the past literature [10, 12].

Hearing loss can result in a reduction in social contacts, yielding to a change in the personality of the hearing impaired. Hearing aids are recommended to overcome these problems and the adverse consequences [13]. The benefits a person is getting from hearing aid/s can be measured through inventories. The results of the current study indicated a considerable level of satisfaction in all areas of the SADL scale except the Negative Features, where the medium level of satisfaction was obtained. This difference in the Negative Features subscale was associated with the background noise which interferes with the output of appropriate amplification device, feedback issues related to the increasing loudness of the hearing aid/s, and difficulty in talking on standard telephones because of the absence of telecoil and different modes (GSM, CDMA, WLL) of teleservice provider. These issues can be overcome by using the latest technologies to minimize background noise and feedback successively. Major hearing aid companies are having products that help hearing impaired on telecommunication, which are lying in the mid and high range of cost and technologies.

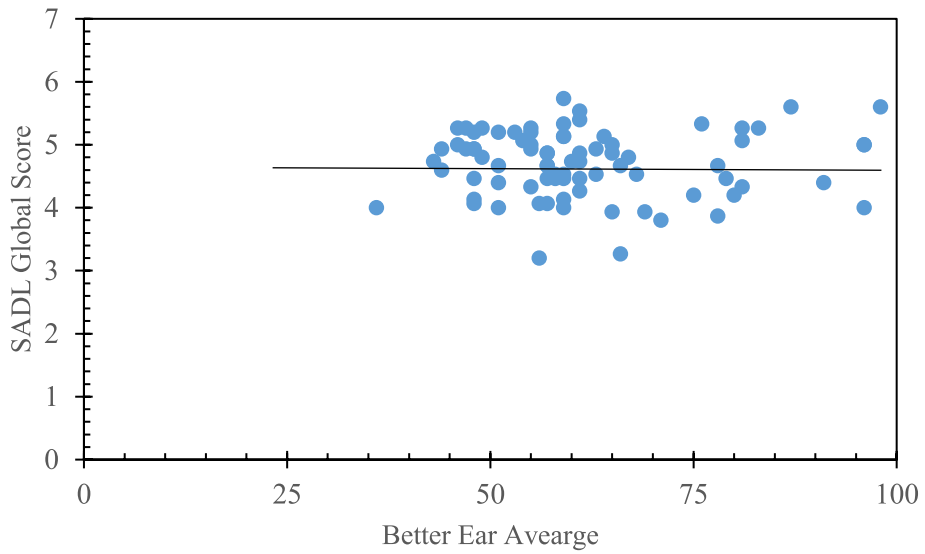

Fig. 1 Correlation between better ear average hearing threshold and global satisfaction

The mean SADL scores obtained for the present study were shown in Table 1. There was a statistically significant difference between the global scores and all subscale scores. These satisfaction differences can be attributed to the cost of the hearing aids, as the hearing aids used by the participants were not falling in the economical range of the users, and also, the cost-benefit ratio they expected was not met. The level of hearing aid technology may be another fact for the difference, as the participants in the study had been fitted with different hearing aids of various grades of technologies. The difference in programmable technology relative to non-programmable technology may be attributed to this difference because programmable technology is related to higher satisfaction than non-programmable technology [8]. Another reason for this difference could be the hearing aid experience. A significant and positive correlation was noted between SADL Global scores and degree of hearing loss ($r = 0.837$). This positive correlation indicates that participants' satisfaction is strongly associated with the degree of hearing loss. It states that participants with greater hearing loss were more satisfied than those participants with minimal hearing loss. There was a positive relationship between the perceived degree of hearing difficulty without hearing aids and mean SADL Global, Positive Effect, and Service and Cost, Personal Image, and Negative Feature scores, which indicates that there is an association between greater perceived hearing difficulties pre-fitting and higher satisfaction scores post fitting. These findings were also consistent with the past literature [8, 12].

Hearing difficulties reported by the individuals may also be used by the clinician as a measure of hearing aid/s success (Dillon at all, 1997). This statement was confirmed in the current study, as the participants who were having moderate and severe difficulties without their hearing aid/s did overcome their difficulties after obtaining the hearing aid/s.

Conclusion

The Hindi-translated version of the Satisfaction with Amplification in Daily Life (SADL) questionnaire was used on 80 participants including both males and females to measure the hearing aid outcomes. A significant positive correlation was seen between the degree of hearing loss and SADL Global satisfaction scores.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s43163-022-00245-7.

Additional file 1. Hindi Questionnaire SADL.

Additional file 2. English Questionnaire SADL.

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Authors' contributions

CU has conceived the idea of the research, planned the execution of the same, developed the questionnaire, and interpreted the findings; RJ helped in developing the questionnaire, collected the data from the participants, and tabulated the required information; SP performed analyses of the data and

had contributed to writing the manuscript. All authors read and approved the final manuscript. The authors would like to declare that no fund was obtained for the current study.

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Availability of data and materials
The datasets analyzed during the study are not publicly available owing to institution ethics committee policies; however, they can be made available from the corresponding author on reasonable request.

Declarations

Ethics and approval and consent to participate
The ethics approval was obtained from Ethics Committee for Academic Research Projects, the ethics committee board of Topiwala National Medical College. The reference number was ECARP/2014/04. Additionally, written informed consent was taken from the participants. All the procedures were non-invasive and follow Helsinki's declaration (2014).

Consent for publication
The consent for publication is not required in the current study.

Competing interests
The authors declare that they have no competing interests.

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