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Translation and validation of tinnitus handicap inventory into Gujarati language

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ABSTRACT

Background: Tinnitus is a very debilitating symptom. Various questionnaires have been developed to quantify the handicap due to tinnitus, out of which THI is widely used. First developed in English language, THI has been adapted in many other languages. In the present study, THI was translated and validated in Gujarati language (THI-Guj).

Methods: THI in English was translated into Gujarati language by the language experts. It was administered to 20 Gujarati speaking people for content validity before finally using on the patients. 68 patients filled the THI-Guj and the scores so obtained were statistically analyzed for reliability scores.

Results: THI-Guj could classify the patients into slight, mild, moderate, severe and catastrophic tinnitus. The overall Cronbach's Alpha score for the inventory was 0.980, while scores for the subscales (functional, emotional and catastrophic) were 0.848, 0.853 and 0.896 respectively, indicating an acceptable reliability.

Conclusions: THI-Guj can be used in assessment and monitoring of tinnitus sufferers, who are Gujarati speakers, by audiologist as well as otologists working in various clinical settings.

Keywords: Gujarati, Reliability, Tinnitus, Tinnitus handicap inventory, Validity

INTRODUCTION

Tinnitus is an aberrant perception of sound without any external stimulus. Tinnitus impinges on the quality of life of affected individuals to varying degrees occurring as a minor irritation to some and in extreme cases result in the intentional or ambivalent self destructive act of suicide. There is no direct method to quantify tinnitus in an individual. However, there are various validated questionnaires available which help in quantifying the effect of tinnitus on the quality of life. Of these, tinnitus handicap inventory (THI) is widely used worldwide to quantify the handicap due to tinnitus. THI was developed in English language in 1996 by Newmann et al as a 25 item questionnaire with three subscales (functional, emotional and catastrophic). Since THI is a self administered questionnaire, it is imperative that patient understands the language. Hence, THI has been translated

and validated in various foreign languages. As far as Indian languages are concerned, THI has been developed in Tamil, Kannada and Malayalam.³⁻⁵ Hence, a need was felt to develop THI into Gujarati language so that is can easily be administered to the Gujarati speaking population.

METHODS

Study design

Prospective, observational questionnaire based study

Place and duration of study

This study was conducted in a tertiary care teaching hospital in Bhuj, Gujarat, from December 2016 to May 2017.

Inclusion criteria

All adult patients (aged 18 to 60 years) who complained of tinnitus of more than three months duration were included in the study.

Exclusion criteria

Exclusion criteria were patients with any pre-existing ear pathology; patients who did not give consent for the study.

68 patients fulfilled the inclusion criteria. A thorough clinical ENT examination was done for all patients. A written and informed consent was taken from all the participants. All patients could read and speak Gujarati. All patients were asked to fill the THI-Guj and a health professional was made available for any help required.

Translation of THI into Gujarati

THI in English was given to five persons who were proficient in Gujarati and English languages. Translation-back translation method was used. Any discrepancies in the five questionnaires developed were sorted by general

consensus. The final THI in Gujarati (THI–Guj) was given to 20 native Gujarati speaking people to check for content validity (Appendix I). These subjects were asked to rate each item of the questionnaire on a Likert's scale from 1 to 5, with 1 being 'highly acceptable' and 5 'not acceptable'. All items received a rating of either 1 or 2 and hence all were retained.

All the completed inventories were analyzed by the first author and scores were calculated. SPSS statistics 21.0 (SPSS Inc. Chicago) was used for statistical analysis.

RESULTS

THI-Guj could classify the patients into slight, mild, moderate, severe and catastrophic tinnitus. Maximum patients (30.9%) had moderate tinnitus, followed by severe (26.4%) and catastrophic (19.1%). Around 24% patients had a total THI core less than 36 (Table 1).

To check the reliability of THI-Guj, Cronbach's Alpha test was applied and the overall score was.980 (Table 2). A reliability coefficient of.70 or higher is considered "acceptable" in most social science research situations. Hence the developed inventory was found to be acceptable and reliable.

Table 1: Distribution of patients according to severity of tinnitus.

THI score	Category of handicap	Percentage of patients (n=68)
0-16	Slight (Grade 1)	7.4
18-36	Mild (Grade 2)	16.2
38-56	Moderate (Grade 3)	30.9
58-76	Severe (Grade 4)	26.4
78-100	Catastrophic (Grade 5)	19.1

Table 2: Cronbach's alpha score for THI-Guj.

Cronbach's alpha	Cronbach's alpha based on standardized items	Number of items
0.980	0.986	25

Table 3: Cronbach's alpha and corrected item-total correction score for individual items of THI-Guj.

Item number *	Yes	Sometimes	No	Corrected item-total correction	Cronbach's alpha if item deleted
1 F	36	14	18	0.876	0.978
2 F	39	09	19	0.943	0.978
3 E	27	15	23	0.998	0.979
4 F	32	14	22	0.981	0.978
5 C	24	15	28	0.747	0.979
6 E	36	16	18	0.833	0.979
7 F	33	19	21	0.861	0.979
8 C	33	13	22	0.982	0.978
9 F	22	11	34	0.544	0.981
10 E	31	17	20	0.897	0.979
11 C	21	12	35	0.455	0.981
12 F	27	16	25	0.972	0.979
13 F	25	18	25	0.918	0.980

Continued.

Item number *	Yes	Sometimes	No	Corrected item-total correction	Cronbach's alpha if item deleted
14 F	28	17	22	0.984	0.979
15 F	21	11	36	0.460	0.982
16 E	34	14	19	0.911	0.978
17 E	25	15	28	0.801	0.979
18 F	28	13	27	0.938	0.978
19 C	39	06	24	0.997	0.978
20 F	35	08	25	1.000	0.978
21 E	32	19	18	0.741	0.979
22 E	33	19	16	0.663	0.980
23 C	27	12	28	0.889	0.978
24 F	35	11	22	0.984	0.978
25 E	34	13	21	0.963	0.978

^{*}F=Functional, E=Emotional, C=Catastrophic.

Table 4: Cronbach's alpha score for THI-Guj subscales.

THI subscale	Corrected item-total correlation	Cronbach's alpha if item deleted
Functional	0.989	0.848
Emotional	0.865	0.853
Catastrophic	0.912	0.896

Further in-depth analysis of the questionnaire for reliability and internal consistency was done and results are shown in Table 3.

The item total correlation is a correlation between the question score (e.g., 0 or 1 for multiple choice) and the overall assessment score. It is expected that if a participant gets a question correct they should, in general, have higher overall assessment scores than participants who get a question wrong. A small item-correlation provides empirical evidence that the item is not measuring the same construct measured by the other items included. A correlation value less than 0.2 or 0.3 indicates that the corresponding item does not correlate very well with the scale overall and, thus, it may be dropped.

Table 3 presents the value that Cronbach's alpha would be if that particular item was deleted from the scale. We can see that removal of any item, except items 9, 11 and 15, would result in a lower Cronbach's alpha. Therefore, we would not want to remove these questions. Removal of questions 9, 11 and 15 would lead to a small improvement in Cronbach's alpha. However, the Corrected item-total correction value of these items was above the acceptable limit (>0.3), hence these items were retained in the questionnaire.

Cronbach's alpha test was further applied on the three subscales (functional, emotional and catastrophic) of THI-Guj and results were shown in Table 4. Overall Cronbach's alpha score for three subscales was. 910 indicating that THI-Guj was reliable and consistent.

DISCUSSION

Tinnitus is a significant condition that may be a burden for people affected. Therefore, it is important to validate tinnitus assessment questionnaires among different agegroups and in different languages. While tinnitus occurs in individuals of all age groups, it most commonly occurs among adults. The problem of tinnitus in India is also as alarming and as severe as in the Western countries; but studies regarding the psychological profiles of individuals with tinnitus are very limited and some studies in India have attempted to reveal the relation between the perceived tinnitus severity and the degree of emotional distress of the individuals.^{6,7} Various tools have been designed to evaluate the effect of tinnitus; some of these are tinnitus handicap questionnaire, tinnitus severity questionnaire, tinnitus handicap inventory and tinnitus functional index. THI is a very useful tool to measure the degree of handicap due to tinnitus. It is easy to administer and interpret, broad in scope, and psychometrically robust. In the present study, THI-Guj could classify the patients according to severity of tinnitus (Table 1).

The first THI was developed by the British Association of Otolaryngologist, Head and Neck Surgeons which consists of 50 questions. Newman et al developed the 25-item inventory which was grouped appropriately into three subscales (functional, emotional, and catastrophic). Functional subscale had 11 questions, emotional had 9, while catastrophic had 5 questions. Since then, THI has been adapted in various languages - Hebrew, Mandarin, Hungarian, French and Russian, to mention just the most recent. 8-12

All previous authors of THI adaptations have confirmed the validity and reliability of their versions. The English version of THI has got a Cronbach's alpha score of 0.93 with an Item-Total Correlation ranging between 0.22-0.77. Similarly, the Cronbach's alpha score for French and Hungarian version was 0.92 and 0.95 respectively. The present developed inventory also had acceptable reliability scores (Table 2 and 3). The results of the present investigation demonstrated that the THI-Guj has an excellent consistency reliability for the total scale (α =0.98) and is adequate for the functional (α =0.848), emotional (α =0.853) and catastrophic (α =0.896) subscales (Table 4).

Construct validity

In order to establish construct validity, the total score on each subscale (i.e. functional, emotional and catastrophic) was correlated with all other subscales and also with the total THI-Guj score. Correlation was found to be significant (p=0.000) across all three subscales and with the total THI-Guj score. This revealed that the subscales consistently measured the attributes they intended to measure.

CONCLUSION

Statistical results obtained for the Gujarati version of THI (THI-Guj) show a good reliability/ internal consistency as indicated by the Cronbach's alpha and corrected Itemtotal correlation score. Hence, this inventory can be used in assessment and monitoring of tinnitus sufferers, who are Gujarati speakers, by audiologist as well as otologists working in various clinical settings across the state. There is a need to validate and translate THI into various local languages so that it can be effectively implemented.

Appendix

Gujarati version of THI (THI-Guj) is available at: drive.google.com/open?id=1zCzApByRtP33WUIL6dJX ES7ESjXH3v9f

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Institutional Ethics Committee

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