

Transadaptation and Standardization of Tinnitus Primary Function Questionnaire in Hindi

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Abstract

The term tinnitus is derived from the Latin word tinnire, meaning to ring. Although it is often referred to as "ringing in the ears, tinnitus can be perceived as many different sounds including hissing, clicking or whistling. India being a multilingual country needs to develop and standardize tinnitus questionnaire in Indian language. There are no significant test materials available with respect to Indian context based on Hindi, which can be routinely used by the professionals to assess the primary effect of tinnitus in patients. Thus, a need was felt to develop instrument in Hindi that can be used as per the ICF (International Classification of Functioning, Disability and Health) classification system in all over the country.

The study aims to evaluate the impact of tinnitus on quality of life of clients having tinnitus with and without hearing loss by using primary function questionnaire (TPF-Hindi). The present study attempts to transadapt and standardize Tinnitus Primary function Questionnaire in Hindi. And administer both the questionnaires (TPFQ-H vs THQ-H) on the tinnitus clients with and without hearing loss and compare the impact of tinnitus in terms of quality of life in subjects with tinnitus with hearing loss and without hearing loss. A 12-item questionnaire was administered to 50 patients (tinnitus with hearing loss and without hearing loss) and compared between two questionnaires Tinnitus Primary Function Questionnaire and Tinnitus Handicapped Questionnaire (TPFQ-H & THQ-H).

The results of the current study were analysed by using Statistical Package for the Social Sciences (SPSSv 20.0). Scores were positively correlated with the Tinnitus Handicap Questionnaire. There is significant correlation between both the scales and reliability between the scales is also good.

Keywords: tinnitus, hindi, TPFQ, THQ-H.

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INTRODUCTION

The term tinnitus is derived from the Latin word "tinnire," meaning "to ring"¹. "Tinnitus is a perception of sound, which is not produced intentionally, and it originates in an involuntary manner in the head of its owner, or may appear to him to do so"². Almost everyone has experienced a short, faint, and ringing in the ears at some time or other. It creates direct impact on a person's emotion, hearing, and ability to sleep and to concentrate-influencing basic life functions, such as socialization and relaxation.

In International Classification of Function, Disability and Health (ICF 2001) tinnitus is coded as a separate condition and is defined as a 'sensation of low-pitched rushing, hissing, or ringing in the ears.' Classification of tinnitus helps in the process of diagnosis and selecting the optimal treatment option for the disorder. Tinnitus has been classified into two broad categories namely subjective and objective tinnitus. Objective tinnitus is audible to any one in addition to the affected individual which is associated with different vascular aetiologies, muscular spasms and eustachian tube dysfunction³. On the other hand, subjective tinnitus is not associated with any physical noise and is only audible to the affected individual and it is referred to as "head noise"⁴.

The prevalence of tinnitus increases with age and found to be more prevalent in men than the women⁵. Approximately 17% of the world, and 4 crore odd in India population has been troubled by tinnitus.

The severity of the tinnitus can be assessed by psycho acoustically method by using some steps⁶. That's identification of the tinnitus ear (in this step the client having tinnitus have to identify in which ear the tinnitus is present), Understanding of the terms "loudness" and "pitch" (in this step, the audiologist have to demonstrate about what is the meaning of loudness and what is the meaning of pitch), Pitch Matching (in this step, the client have to match the pitch of tinnitus signal with the signal of audiometer), Loudness Matching (in this step, the client have to match the loudness of tinnitus with the loudness of the matched pitch produced by audiometer). Dauman and Tyler in 1992 proposed a psychological model of tinnitus in which the overall impact of tinnitus is influenced by the characteristics of the tinnitus (pitch, loudness, and quality) and the psychological makeup of the individual. It was suggested that treatments that are aimed at reducing reactions to tinnitus should use questionnaire, whereas treatments aimed at reducing the magnitude of the tinnitus should focus on tinnitus measures (loudness and masking).

Several questionnaires have now been developed to document the handicapping nature of tinnitus and to measure change in clinical trials^{7,8}. Tinnitus questionnaires began by simply asking clients to list the problems that they attributed to their tinnitus⁹. Several questionnaires like Tinnitus Handicap Questionnaire

(THQ), Tinnitus Reaction Questionnaire (TRQ), Tinnitus Handicap Inventory (THI), Tinnitus Questionnaire, The Tinnitus Functional Index (TFI) and The Tinnitus Primary Function questionnaire (TPFQ) are designed to evaluate how tinnitus affects the primary ways tinnitus impacts a person's quality of life^{7,10-12}.

A new questionnaire Tinnitus Primary Function Questionnaire (TPFQ) was designed to specifically evaluate how tinnitus affects the primary ways impacts a person's life. It focuses on the four areas (a) emotions, (b) hearing, (c) sleep and (d) concentration. The present study attempts to transadapt and standardize tinnitus primary function questionnaire in Hindi to evaluate the impact of tinnitus on quality of life of clients having tinnitus with and without hearing loss by using primary functions questionnaire (Hindi).

METHODOLOGY

A total of 50 participants (age range 20 to 70 years) (mean age: 41.4 and standard deviation of age: 13.4) were selected for the study based on the inclusion and exclusion criteria. All the participants having subjective, permanent and spontaneous unilateral or bilateral subjective idiopathic tinnitus with and without hearing loss were taken in the present study.

The Participants who fulfilled the criteria for the study were selected and oral consent was present to the participants. They were instructed to read the questionnaire (self-questionnaire TPFQ-H) thoroughly and complete comfortably.

Group-1: The group 1 consisted of 27 participants having tinnitus with hearing loss of age range 20 to 70 years.

Group-2: The group 2 consisted of 23 participants having tinnitus with normal hearing of age range 20 to 70 years.

Group-3: Group 3 was consisted of twenty normal participants and five participants with tinnitus and hearing loss (not included for statistical analysis). The suggestions given by these participants regarding the test material were included in the actual test material (for linguistic validation of developed transadapt TPFQ-H).

Inclusion criteria

Participants were selected on the basis of following inclusionary criteria-

1. Participants having subjective unilateral or bilateral tinnitus.
2. Both genders (male and female)
3. Normal hearing and hearing impaired (Unilateral and bilateral hearing impaired) patients with tinnitus.
4. Minimum duration of tinnitus 3 months.
5. Participants should have knowledge of Hindi language.

Exclusion criteria

Participant with neurological, psychological & behavioural issues were excluded from the present study.

Material/Tools

1. Tinnitus Primary Function Questionnaire (TPFQ-H)

2. Tinnitus Handicap Questionnaire (THQ-H)

(The questionnaire focuses on four areas: Concentration, Emotion, Hearing, and Sleep)

The four subscales include:

A. Concentration: Questions 1, 2 and 3

B. Emotion: Question 4, 5, 6

C. Hearing: Question 7, 8, 9

D. Sleep: Question 10, 11, 12

All subjects were asked to Scoring based on likert scale ,the participant responds with scores one to five: fully agree ('5'), mostly agree ('4'), sometimes agree ('3'), partially agree ('2') and fully disagree ('1').

Procedure:

The research was based on following stages:

Stage 1: Transadptation of tinnitus primary function questionnaire in Hindi (By using standard Translation-back-Translation method).

Stage 2: Linguistics validation of feedback rating of the transadapt tinnitus primary function questionnaire.

Stage 3: Administering the transadapted questionnaire (TPFQ-H & THQ-H) on participants with tinnitus (with hearing loss and without hearing loss) and obtained the test score.

Stage 4: Validation of tinnitus primary function questionnaire in hindi.

Stage 5: Checking the reliability of 12 questionnaire of hindi version of tinnitus primary function (TPFQ-H).

Stage 1: Transadptation (Translation):

The linguistic validation of the original version of the tinnitus primary function questionnaire into the hindi version, and its psychometric specification was done with the assistance of a professional in the following steps:

a. Forward Translation:

In the first step Tinnitus Primary Function Questionnaire (TPFQ) English was translated in Hindi by ten native speakers of Hindi, with high level of proficiency in English and Hindi.

b. Backward Translation:

In the second step of linguistic validation, reverse- translation from Hindi to English was done to check intactness of meaning by another ten native

Hindi speakers with high level of proficiency in Hindi languages. Back translation of the transadpted Tinnitus Primary Function Questionnaire (TPFQ-H) to English was done to measure the homogeneity of the original version of Tinnitus Primary Function Questionnaire.

Preparation of final tool:

Transadapt Tinnitus Primary Function Questionnaire was arranged accordingly. The transadapt TPF-H questionnaire consisted of 12 questions, which was divided into four sub-scales. The four sub-scales address four- important domains of negative impact of tinnitus: concentration, emotion, hearing, sleep.

Stage 2: Linguistic validation of Feedback rating of the transadapt Tinnitus Primary Function Questionnaire

Transadapted TPFQ-H was provided to five native Hindi speakers who were Speech Language Pathologists (SLPs) and Audiologists, having at least two years of clinical experience for feedback rating and appropriateness of newly developed tool. The purpose of linguistic validation was to rule out dialectic variations, if any, in the questionnaire and incorporate appropriate suggestions of the professionals. It was noted that, similar findings emerged as during the Forward-Backward translation; no linguistic difficulty was reported by participating Audiologists and Speech and Language Pathologist.

Pilot study

The Questionnaire (TPFQ-H) was administered on twenty normal participants having no history of hearing loss and tinnitus and five participant having tinnitus with hearing loss (group 3). (Ten Hindi speakers students of standard 10th, who has no idea about tinnitus and another 10 Hindi speaker student from BASLP and MASLP field who has concept of tinnitus). These participants were not included in the actual study. The suggestions given by these participants regarding the test material were included in the actual test material (for dialect variation & linguistic validation).Based on the pilot study time taken for the administration of the developed transadapted TPFQ-H was approximately 15-20 minutes.

Stage 3: Administering the transadapted test on participants with tinnitus and obtaining the test score:

The developed transadapt TPFQ-H was given to all the participants of the present study for self-rating. The participants were prior informed that the transadapt TPFQ-H being administered for the purpose of research. They were briefed about the TPFQ-H questions. Participants were asked to read the questions carefully and Circle the appropriate rating in 1-5 rating scale. Each rating option was explained to all the participants with the help of few examples from day to day life. Any clarification requested by the participants was provided

by the researcher. Time provided to each participant was 15-20 minutes for completing their rating.

Stage 4: Validation of Tinnitus Primary function Questionnaire-Hindi:

The total scores from Tinnitus Primary Functions-Hindi (12 items) version were significantly correlated with Tinnitus Handicap Questionnaire (THQ-H) for validation of TPF. The THQ-H presented to each subjects (50) one by one and scoring was based on likert scale (1-5 rating scales). Validity indicates that the test measures what it purports to measure. This is usually demonstrated by comparing it with a previously similar test. For example, the TFI was validated with the THI, which was in turn validated with the THQ⁷.

Stage 5: Checking the reliability of the transadapt Tinnitus Primary Function:

Reliability was checked through statistical analysis by using Cronbach's alpha and Cronbach's alpha was calculated for all 12 items.

Scoring

Scoring of the TPFQ based on 1 to 5 point likert scale, For each item on questionnaire, the participant responds with scores one to five: fully agree ('5'), mostly agree ('4'), sometimes agree ('3'), partially agree ('2') and fully disagree ('1').

The responses are summed up with a total score ranging from 1 to 5 points. Higher scores represented greater perceived difficulty. Severity of the problem could also found out based on 5 categories of scales (likert-scale) calculated for the total TPFQ-H score.

Another questionnaire Tinnitus Handicap Questionnaire (THQ-H) has 27 questions. All of them are divided into three factors: factor 1 (Behavioral, Social, and Emotional) and factor 2 (Hearing abilities), factor 3 (Perspective). Severity of the problem could also found out based on 5 categories of scales (likert-scale) calculated for the total THQ-H score.

RESULTS AND DISCUSSION

The obtained scores of each participant were entered separately in terms of total TPFQ-H and its four subscale i.e., (a) concentration (b) emotions (c) hearing, and (c) sleep in Statistical Package for Social Sciences (SPSSv- 20.0) system and analysed by using Pearson correlation, Cronbach's alpha and Parametric (Independent) t-test. Mean and standard deviation of total TPFQ-H and its four subscales were calculated. The English version of the questionnaire transadapt into Hindi was administered in group of Hindi speaking individual with tinnitus. Tinnitus Handicap Questionnaire Hindi version administered on same group for correlation and validation of questionnaire¹⁰. Both questionnaires were administered to the same subjects one by one and the total score from the two questionnaires was computed for correlation. It helps to measure the severity and negative

impact of tinnitus with and without hearing loss. It also helps to measure the complex interference of tinnitus with psychological distress and quality of life.

The Mean & Standard deviation and Pearson's correlation, Cronbach's alpha scores was found for TPFQ-H & THQ-H and its subscales.

There is no significant difference in overall scores obtained on TPFQ-H and THQ-H clients having tinnitus with hearing loss and without hearing loss

Table 1 show the overall mean score obtained on for TPFQ-H is 35.50 with SD 11.12 and for THQ-H 82.44 with SD 20.35 .Pearson product movement correlation was done to find out correlation between both the scales. The results indicate the correlation value of 0.729 with significance of 0.000 at the level 0.01 that showed Positive correlation between both questionnaires.

There is no significant correlation in domain wise scores obtained on TPFQ-H and THQ-H clients having tinnitus with hearing loss and without hearing loss

Pearson's correlation

The correlation between (Factor 1 & 2 and subscale of TPFQ-H) showed excellent correlation, significant at 0.01 levels & 0.05 levels (Positive correlation). Factor 3 and subscale 3 showed less correlation. Hence, both questionnaires can be used for clinical purpose (Table 2).

Reliability statistics

A high Cronbach's alpha (i.e., above 0.7; Nunnally 1978) would suggest better internal consistency reliability for a particular questionnaire. Results revealed a high Cronbach's alpha for 12-questionnaire; TPF-Hindi version demonstrates good reliability (Table 3).

Hence, based on the above results it can be noted that there is significant correlation between both the scales and reliability between the scales is also good. Therefore both the scales can be used for finding out impact of tinnitus on individuals' primary functions.

Table 1. Total score of TPFQ-H & THQ-H, Mean & SD and Pearson's correlation.

N (50)	Mean	SD	Pearson Correlation	Sig. Value
TPFQ-H (12 questions)	35.5	11.12	0.729	0
THQ-H (27 questions)	82.44	20.35		

Table 2. Correlation of TPFQ-H (subscales) with THQ-H (subscales).

THQ-H	TPFQ-H	Pearson's correlation	Significance
Factor 1 (Behavior, social & emotion)	Concentration	0.453	0.001
Factor 1 (Behavior, social & emotion)	Emotions	0.625	0
Factor 2 (Hearing)	Hearing	0.429	0.002
Factor 3 (Perspective)	Sleep	0.266	0.062

However, the Tinnitus Primary Function Questionnaire was more sensitive to changes in tinnitus function.

There is no significant difference in scores obtained on all four domains of TPFQ-H in clients having tinnitus with and without hearing loss

Mean and Standard Deviation

Table 4 and Figure 1 represents the obtained Mean & SD of TPFQ-H (Subscale: Concentration, Emotion, and Hearing & Sleep). The obtained mean and SD for concentration, with and without hearing loss were 8.37 & 7.70 and 3.8 & 3.8. For the emotional subscale, mean & SD for hearing loss and without hearing loss were 11.74 & 10.22 and 3.2 & 3.34. For the hearing subscale, for both subjects mean & SD were 9.19 & 4.78 and 3.3 & 2.5. For the sleep subscale, both subjects mean & SD were 10.22 & 8.09 and 3.9 & 3.9.

Table 3. Alpha coefficient (Cronbach's alpha)

	TPF-H	THQ-H	Overall
N	4 (subscales)	3 (subscales)	7
Cronbach's alpha	0.731	0.711	0.811

Table 4. TPFQ-H subscale (Concentration, emotion, hearing, sleep) with and without hearing loss.

N (50)	N (with HL) & (without HL)	Mean	SD	t-value	Significant value
Concentration	27	8.37	4	0.618	0.54
	23	7.7	4		
Emotion	27	11.7	3	1.623	0.111
	23	10.2	3		
Hearing	27	9.19	3	5.208	0
	23	4.78	3		
Sleep	27	10.2	4	1.908	0.062
	23	8.09	4		

To find out significant difference between the means t-test was done and results indicate the t values for subscale concentration is 0.618 (0.540) for subscale emotion 1.623 (0.111) for subscale hearing 5.208 (0.000) and for subscale sleep 1.908 (0.062) indicating the only in subscale hearing there is significant difference among groups. However, it can be noted that on the other three subscales both the groups had same scores.

There is no significant difference in scores obtained on three factors of THQ-H in clients having tinnitus with and without hearing loss

Table 5 and Figure 2 represents the obtained Mean & SD of THQ-H (Subscale: Factor 1 (behavior, social & emotion), Factor 2 (hearing), Factor 3 (perspective) The obtained mean and SD for factor 1 with and without hearing loss were (53.41 & 43.35 and 12.74 & 10.44). For Factor 2, mean & SD for hearing loss and without hearing losses were 23.59 & 20.43 and 6.07 & 6.83). For Factor 3, for both subjects mean & SD were 11.37 & 11.70 and 3.6 & 3.9.

To find out significant difference between the means paired "t" test was done and results indicate the t values

Table 5. Mean and SD of THQ-H total and subscales of tinnitus with and without hearing loss.

N (27 + 23 = 50)	With HL & Without HL	Mean	SD	t-value	Significant value
Factor 1 (Behavior, social & emotion)	27	53.4	13	3.018	0.004
	23	43.4	10		
Factor 2 (Hearing)	27	23.6	6	1.729	0.09
	23	20.4	7		
Factor 3 (Perspective)	27	11.4	4	(-0.305)	0.762
	23	11.7	4		

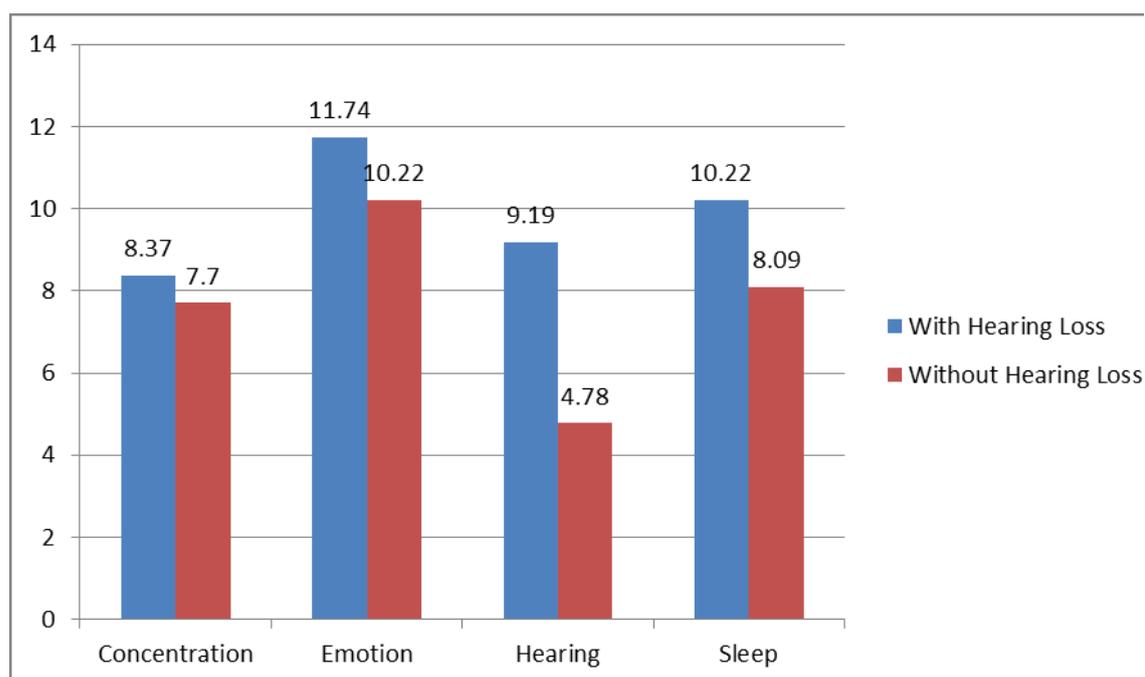


Figure 1. Shows a graphical representation of mean obtained on subscale of TPFQ-H for both the groups.

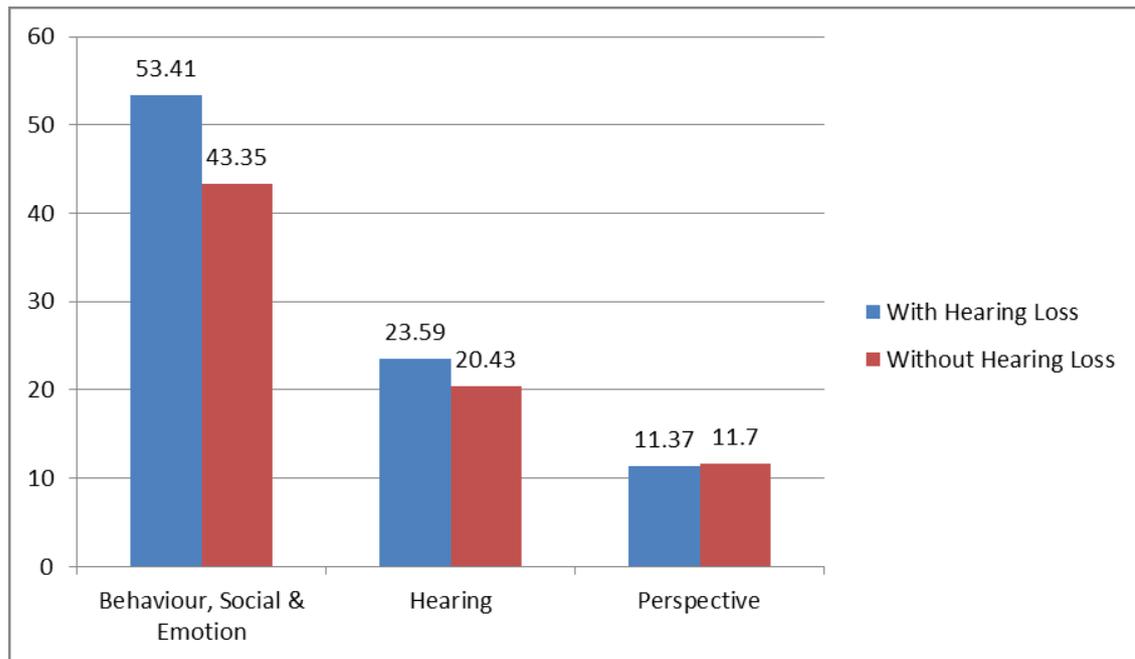


Figure 2. Graphical representation of comparison of subscales of TPFQ-H & THQ-H among both groups.

for factor 1 is 3.018 (0.004) for factor 2 is 1.729 (0.090) for factor 3 is 0.305 (0.762) indicating the only factor 1 there is significant difference among groups. However, it can be noted that on the other two factors both the groups had similar scores.

These findings suggest that among three subscales, factor 1 (behavior, social & emotion) indicates significant difference between the scores of subjects having tinnitus with hearing and subjects having tinnitus without hearing loss which shows that tinnitus effects social, behavior and emotional aspects of life.

SUMMARY AND CONCLUSION

The present study focused on evaluating the reaction and impact of tinnitus with the self-reported questionnaire. Most of the instruments that evaluate the “quality of life” were developed in English and were intended to be used in English speaking countries. The study is needed to develop instruments to be used in countries where English is not a native language. Such questionnaires when used with the person having different language backgrounds will not yield exact result. There are very few questionnaire developed in Indian languages to assess negative impact due to tinnitus. The present study is an attempt to transadapt and standardizes Tinnitus Primary Function (TPFQ) in Hindi language. So it will help to provide an efficient and easy measure of negative impact related with tinnitus.

To standardize Tinnitus Primary Function (TPFQ) in Hindi, reliability and validity of the H-TPFQ were thoroughly studied after the linguistic validation. The results indicated good correlation between score of TPF-Hindi and THQ-Hindi, High internal consistency among the twelve questionnaire of TPF-H and high correlation in test-retest reliability.

To conclude, Tinnitus is a well-accepted issue that affects the overall Quality of Life of individuals with tinnitus. Literature has supported the need for assessing the Quality of Life in this population. Considering the need for having reliable questionnaires, questionnaires have been developed or translated in various languages. The English version of Tinnitus Primary Function Questionnaire (TFP) found to be more robust and reliable among them was selected for translation in Hindi language.

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