



## Patient-Oriented Measurement of Tinnitus in the Manipuri Language

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### Abstract

Tinnitus, the perception of sound in the absence of an external stimulus, is commonly assessed using the Tinnitus Handicap Inventory (THI). In Manipuri-speaking regions, reliance on the English version of the THI poses challenges for individuals with limited English proficiency. This study aimed to culturally and linguistically adapt the THI into Manipuri (THI-M) and evaluate its reliability for measuring tinnitus-related handicap.

Sixty participants aged 25 to 60 years with varying tinnitus severity were included. The adaptation followed a five-step cross-cultural translation protocol. THI-M was administered, and data were analyzed using SPSS for item analysis and reliability testing. Ten items were removed based on statistical criteria. Among the remaining items, the functional domain had the highest mean score ( $M = 20.67$ ,  $SD = 7.284$ ), followed by emotional ( $M = 11.33$ ,  $SD = 4.373$ ) and catastrophic ( $M = 5.93$ ,  $SD = 3.769$ ) domains. The total scale showed strong internal consistency (Cronbach's  $\alpha = 0.808$ ), with domain-specific alpha values ranging from 0.370 to 0.663.

The results indicate that THI-M is a reliable and culturally appropriate tool for evaluating the impact of tinnitus in Manipuri-speaking individuals. Functional difficulties were most pronounced, emphasizing the importance of linguistically adapted assessment tools in clinical practice. THI-M supports more accurate screening, diagnosis, and management of tinnitus in this population.

**Keywords:** Tinnitus Handicap Inventory; Reliability; Cultural Translation

### Abbreviation

THI-M: Tinnitus Handicapped Inventory – Manipuri

### Introduction

Tinnitus is defined as the perception of sound in the absence of any external auditory stimulus [1]. It manifests commonly as ringing, buzzing, hissing, or clicking sounds in one or both ears and can range from a subtle background noise to a loud, intrusive sound. While occasional, brief episodes of tinnitus are experienced by nearly everyone—such as after exposure to loud music or sudden noise—in some individuals, tinnitus becomes a persistent and distressing condition.

Described by Han., *et al.* [2] as a “phantom auditory perception,” tinnitus is not linked to external acoustic or mechanical activity in the cochlea. It is frequently associated with hearing-related disorders, though in many cases, no definitive cause is identified. According to Jarach., *et al.* [3], tinnitus affects more than 740 million adults globally, with over 120 million individuals—primarily aged 65 and above—reporting it as a serious health issue. Tinnitus is not just an auditory condition but also has significant psychological implications. It can impair concentration, disrupt sleep, and increase levels of stress, anxiety, and depression. Given its subjective nature and its effects on quality of life, the evaluation and measurement of tinnitus must extend beyond physiological tests to include psychological and self-reported assessments.

Traditional clinical assessment methods for tinnitus typically include audiograms, pitch and loudness matching, and masking techniques. While these methods provide some insight into the acoustic characteristics of tinnitus, they fail to capture the personal, emotional, and social burden experienced by the patient [4]. Consequently, patient-reported outcome measures have emerged as essential tools in the clinical evaluation of tinnitus. Self-report questionnaires such as the Tinnitus Handicap Inventory (THI), Tinnitus Questionnaire (TQ), and Tinnitus Functional Index (TFI) have been developed to evaluate the impact of tinnitus on daily life. These instruments assess domains such as emotional distress, sleep disturbance, concentration difficulties, and hearing impairment [5,6]. Furthermore, recent advancements in psychophysical methods, including pitch and loudness matching and minimum masking levels, provide some quantitative data [7]. However, these still do not correlate well with perceived handicap or emotional suffering, highlighting the importance of subjective measurement tools.

The translation and cultural adaptation of tinnitus questionnaires into native languages are crucial for effective clinical use in diverse populations. Without culturally relevant tools, accurate diagnosis and management become difficult. Despite the high prevalence of tinnitus in India, there is a lack of validated tools in many regional languages, including Manipuri. Thus, the development of a patient-oriented tinnitus assessment tool in the Manipuri language is both timely and necessary. It will enable audiologists and clinicians to better evaluate the impact of tinnitus in Manipuri-speaking populations and to implement more effective, culturally sensitive interventions.

The primary aim of the present study is to develop and administer a patient-oriented measurement tool for tinnitus in the Manipuri language, with the objective of assessing the self-perceived handicap experienced by individuals with tinnitus. By evaluating the psychosocial and functional impact of tinnitus through a culturally and linguistically adapted self-report instrument, the study seeks to facilitate more accurate and personalized clinical assessment for Manipuri-speaking populations.

## Materials and Methods

The study was conducted in two phases: (1) the translation and cultural adaptation of the Tinnitus Handicap Inventory (THI)

into Manipuri, and (2) the administration of the translated version (THI-M) to individuals with tinnitus in Manipur.

In Phase 1, with permission from the original author [5], the English THI was translated into Manipuri following the five-step cross-cultural adaptation process outlined by Guillemin, *et al.* [8]. This process included forward translation by bilingual native Manipuri speakers, backward translation by an English-native bilingual, synthesis of translations, expert committee review for semantic and cultural equivalence, and pilot testing with native speakers. Items rated as less familiar were revised based on participant feedback. The final version was validated by a linguist and reviewed by an audiologist to ensure clinical relevance. The Tinnitus Handicap Inventory (THI) is a standardized self-report questionnaire designed to assess the impact of tinnitus on an individual's daily life. It consists of 25 items distributed across three domains (functional, emotional, and catastrophic). Each item offers three response options: "Yes," "No," and "Sometimes".

## Participants

The study involved 60 Manipuri-speaking individuals, aged 25 to 60 years, all presenting with complaints of tinnitus. Participants were selected based on defined inclusion and exclusion criteria to ensure the reliability and relevance of the data. Only those with normal vision and literacy in Manipuri were included, while individuals with speech or language deficits, multiple disabilities, blindness, psychological or neurological conditions were excluded. This careful selection ensured participants could fully comprehend and accurately respond to the administered questionnaire, thereby enhancing the validity of the study findings.

In Phase 2, Administration of the Tinnitus Handicap Inventory in a Tinnitus-Affected Cohort: Participants were recruited based on predefined inclusion and exclusion criteria. Eligible individuals were introduced to the study protocol and informed that the assessment tool, the Tinnitus Handicap Inventory (THI), is a self-administered instrument. Participants were assured that their involvement was entirely voluntary and that all personal data would be handled with the utmost confidentiality. Informed written consent was obtained from each participant prior to commencement. Upon administration, participants independently completed the THI, selecting responses that best reflected their experience from among three categorical options: Yes, Sometimes, and No. The for-

mat was designed to encourage honest self-reflection, with minimal external interference; assistance was provided only when clarification was explicitly requested.

The THI is designed for completion within approximately 10 to 15 minutes and requires no specialized training to administer. Each item on the inventory permits one of three responses: “Yes” (scored as 4), “Sometimes” (scored as 2), and “No” (scored as 0). The cumulative score—ranging from 0 to 100—provides a quantitative representation of tinnitus-related handicap severity. Higher aggregate scores indicate greater perceived disability. Sub scores may also be computed for specific domains within the inventory. Severity classifications based on total scores are as follows:

- 0–16: Slight handicap
- 18–36: Mild handicap
- 38–56: Moderate handicap
- 58–76: Severe handicap
- 78–100: Profound handicap

Statistical analysis

The data analysis for this study was carried out using both SPSS (Statistical Package for the Social Sciences) and Microsoft Excel, which provided comprehensive tools for statistical computation and data organization. To assess the reliability of the questionnaire used in the study, Cronbach’s Alpha was calculated. This statistical measure evaluates the internal consistency of a set of scale or test items, ensuring that the items reliably measure the same underlying construct. Specifically, internal consistency was examined within the Tinnitus Handicap Inventory (THI) to determine the coherence of responses across its various items, indicating the reliability of participants’ responses. In addition, descriptive statistical analysis was performed to provide a summary of the data, including measures such as means, standard deviations, frequencies, and percentages. This helped in understanding the general distribution and characteristics of the collected data.

**Table 1:** Overall reliability of the tinnitus handicap inventory in Manipuri (THI-M).

No. of items	Cronbach’s alpha
25	0.808

Results and Discussion

The Tinnitus Handicap Inventory in Manipuri (THI-M) demonstrated good internal consistency with a Cronbach’s alpha of 0.808 (Table 1), indicating reliable measurement. Item-total correlations ranged from 0.016 to 0.69. This reliability is comparable to the original English version ( $\alpha = 0.93$ ) and other language adaptations such as Portuguese ( $\alpha = 0.94$ ), Greek ( $\alpha = 0.92$ ), and Chinese ( $\alpha = 0.93$ ). Similar findings of high reliability were observed in THI versions in Malayalam ( $\alpha = 0.766, 0.693, 0.630$ ), Nepali ( $\alpha = 0.92$  overall; 0.91, 0.91, 0.80 subscales), and Kannada ( $\alpha = 0.883$ ), supporting the cross-linguistic consistency and validity of THI tools.

Item analysis and inter-item correlation were conducted on the 25 THI-M items to assess individual item performance and content validity. Items with correlation coefficients  $<0.30$  or  $>0.80$  were excluded, following standard criteria from Western quality-of-life inventories.

Ten items (Table 2) across the functional, emotional, and catastrophic domains of THI-M showed poor correlation with the total score ( $r < 0.30$ ), suggesting potential deletion. However, all items were retained due to their strong theoretical relevance, and this did not affect the overall Cronbach’s alpha value.

Item	Questions	Inter-item Correlation
F4	Does your tinnitus make you confused?	.295
F7	Because of your tinnitus do you have trouble falling	.275
F12	A sleep at night? Does your tinnitus make it difficult to enjoy life?	.291
F14	Because of your tinnitus do you find that you are often irritable?	.108
F20	Because of your tinnitus do you often feel tired?	.137
E3	Does your tinnitus make you angry?	.247
E16	Does your tinnitus make you upset?	.295
E17	Do you feel that your tinnitus has placed stress on your relationships with members of your family and friends?	.257
E22	Does tinnitus make you feel anxious?	.016
C5	Because of your tinnitus are you desperate?	.266

**Table 2:** Description of the questions to be deleted along with their alpha values.

Item-total correlation was assessed using Pearson’s correlation in SPSS, with all items showing (Table 3) statistically significant correlations at  $p < 0.05$ , indicating strong linear relationships. These findings align with previous studies, including Neupane., *et al.* [9], who reported item-total correlations ranging from 0.07 to 0.90 in the Nepali THI, and Naik., *et al.* [10], who found correlations between 0.02 and 0.67 in the Kannada version.

The mean and standard deviation scores (Table 4) of the THI-M revealed the highest impact in the functional domain ( $M = 20.67$ ,  $SD = 7.28$ ), followed by the emotional ( $M = 11.33$ ,  $SD = 4.37$ ) and catastrophic domains ( $M = 5.93$ ,  $SD = 3.77$ ). These findings align with previous studies by Papitsi., *et al.* [11] and Meng., *et al.* [12], which also reported the functional domain as the most affected in Greek and Chinese versions of the THI.

Table 4: Mean and S.D for each domain of THI.

Domain total	No. of items	Mean	S.D.
Functional	12	20.67	7.284
Emotional	8	11.33	4.373
Catastrophic	5	5.93	3.769
Gross total	30	37.93	15.426

Severity in percentage

Frequency item analysis of the obtained data and the percentile of the individuals across various severities were achieved. The total THI-Manipuri version score of all the individuals ranged from slight to severe degrees as represented in the table.

The THI-Manipuri version effectively categorized tinnitus severity (Table 5) into five levels: 0% catastrophic, 10% severe, 46.7% moderate, 26.7% mild, and 16.7% slight among 30 individuals with hearing loss.

Table 6: Percentage of individuals falling under different subscales of Tinnitus Handicap Inventory-Manipuri (THI-M).

Functional			Emotional			Catastrophic		
YES	SOMETIMES	NO	YES	SOMETIMES	NO	YES	SOMETIMES	NO
18.22	49.44	32.22	11.66	47.50	40.83	8.60	42	49.33

THI score	Category of handicap	Percentage of patients (n = 30)
0-16	Slight	16.7%
18-36	Mild	26.7%
38-56	Moderate	46.7%
58-76	Severe	10.0%
78-100	Catastrophic	0

Table 5: Distribution of patients according to the severity of tinnitus.

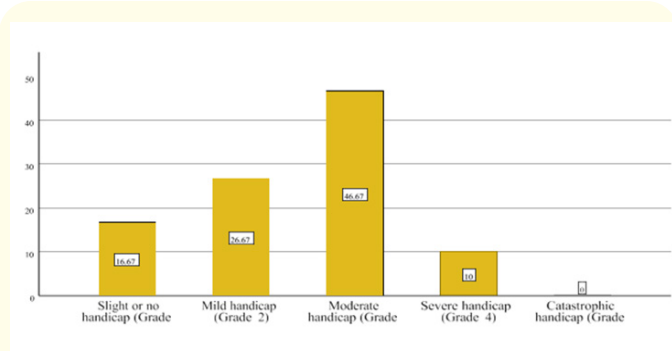


Figure 1: Percentage of individuals falling under different severities of tinnitus as per Tinnitus Handicap Inventory classification.

Subscale analysis (Table 6) showed varied response distributions—functional: YES (18.22%), SOMETIMES (49.44%), NO (32.22%); emotional: YES (11.66%), SOMETIMES (47.50%), NO (40.83%); and catastrophic: YES (8.60%), SOMETIMES (42%), NO (49.33%).

The findings of the present study align with those of Anuj Kumar Neupane., *et al.* [9] and Priyanka Vas Naik., *et al.* [10]. Neupane’s study using the THI-Nepali version reported tinnitus se-

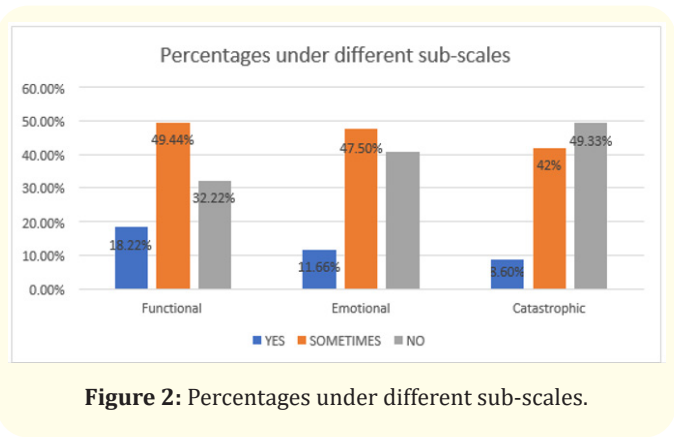


Figure 2: Percentages under different sub-scales.

verity ranging from slight to severe, with no cases of catastrophic tinnitus—34% slight, 26% mild, 20% moderate, and 20% severe. Similarly, Naik’s study on the THI-Kannada version found varying severity levels: 14% slight, 38% mild, 26% moderate, 16% severe, and 6% catastrophic. Subscale response patterns also showed comparable trends across functional, emotional, and catastrophic domain.

Conclusion

In conclusion the present study successfully adapted and validated the Tinnitus Handicap Inventory for the Manipuri-speaking population (THI-M), demonstrating strong reliability as indicated by Cronbach’s alpha. The THI-M proved to be an effective tool for evaluating the impact of tinnitus, with the catastrophic domain emerging as the most affected overall. Additionally, functional difficulties were found to be more pronounced among older individuals. The instrument exhibited satisfactory psychometric properties, confirming its suitability for clinical application in assessing tinnitus-related quality of life among Manipuri speakers. Upon publication, the THI-M is expected to serve as a valuable resource for enhancing tinnitus diagnosis, monitoring, and management within this linguistic and cultural group.

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Conflict of Interest

Nil.

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