

Validity of a filipino translation of the Tinnitus Handicap Inventory

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Abstract

Objective: To determine the validity and reliability of a Filipino translation of the Tinnitus Handicap Inventory (THI), a self-report measure of tinnitus handicap. **Design:** Psychometric cross-sectional validation **Study sample:** Seventy-five patients, aged 18-82 with tinnitus recruited consecutively at the Ear Unit of the Philippine General Hospital after receiving assessment at the Ear, Nose, and Throat-Out Patient Department. **Results:** The THI-PH showed robust internal consistency reliability (Cronbach's alpha = 0.92), only slightly lower than the original version (THI-US Cronbach's alpha = 0.93), and its Danish (Cronbach's alpha = 0.93), Portuguese (Cronbach's alpha = 0.94), and German (Cronbach's alpha = 0.93) translations. Two of the subscales, the Functional and Emotional subscales, also showed good internal consistency reliability (Cronbach's alpha = 0.86 and Cronbach's alpha = 0.82, respectively). The Catastrophic subscale showed poorer internal consistency reliability (Cronbach's alpha = 0.63) due to the shorter number of items in that scale. **Conclusion:** The results of the present study suggest that the THI-PH is a valid and reliable tool that can be used to quantify the effects of tinnitus on the quality of life of Filipino tinnitus patients.

Keywords: quality of life, questionnaires, tinnitus.

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INTRODUCTION

Tinnitus is a symptom that affects millions of people worldwide. In the United States alone, the American Tinnitus Association estimates that around 40 million Americans experience tinnitus regularly, 10 million seek medical attention for it, and close to two million find their tinnitus to be debilitating¹.

In the Philippines, there is a need for further research on tinnitus. There have been a few studies on the efficacy of medications in the treatment of tinnitus, but none on the local prevalence and incidence of tinnitus.

A review of the audiology request forms at the Ear Unit of the Philippine General Hospital from January to July 2009 revealed that out of 1079 patients that underwent audiometry testing, 348 complained of tinnitus - 207 of which as a symptom secondary to another problem, and 141 as a chief complaint.

These findings were supported by a 2007 study by Santos-Cortez et al. reporting audiologic profiles of the Philippine National Ear Institute (PNEI) patients. Out of the 1,756 reviewed patient records, they discovered that tinnitus was the third most common pretest diagnosis, comprising 9.3 per cent².

Depending on its severity, tinnitus can have serious effects on a patient's quality of life. A study by Härter et al. (2004) found that patients with severe tinnitus usually experience a high degree of anxiety and depression and a low quality of life³. Tyler and Baker (1983) found that tinnitus is associated with numerous complaints including irritability, depression, inability to relax and sleep, and concentration problems⁴.

Erlandsson et al. (1992) also reported that tinnitus has been associated with various psychological and psychosomatic problems⁵. Another study by Zöger et al. (2006) concluded that "tinnitus severity is associated with psychiatric disorders as well as with the severity of anxiety and depression." Zöger and his colleagues also advised clinicians to always take anxiety and depression into account when treating or counseling tinnitus patients⁶.

There are a number of questionnaires available to measure the effects of tinnitus on quality of life. One is the Tinnitus Reaction Questionnaire which aims to describe the psychological distress associated with tinnitus⁷. Another is the Tinnitus Problem Questionnaire for determining the different health, hearing, sleep, psychological, and situational difficulties associated with tinnitus¹³. Another questionnaire is the Tinnitus Handicap Questionnaire by Kuk et al. (1990) which can be used to "compare the patient's tinnitus handicap with the norm, identify specific areas of handicap, and monitor progress with treatment programs⁸.

Finally, there is the Tinnitus Handicap Inventory (THI) by Neman et al. which was created to assess the severity of tinnitus by targeting the emotional, functional, and catastrophic effects of tinnitus on the patient. It could also be used to evaluate the effectiveness of tinnitus therapy⁹.

The THI has been translated and adapted into Danish by Zachariae et al. (2000)¹⁰, Spanish by Herráiz et al. (2001)¹¹, Korean by Kim et al. (2002)¹², Japanese by Shinden et al. (2002)¹³, Brazilian Portuguese by Ferreira et al. (2005)¹⁴ and Schmidt et al. (2006)¹⁵, Turkish by Songul et al. (2007)¹⁶, Italian by Monzani et al. (2008)¹⁷, German by Landgrebe et al. (2009)¹⁸, Chinese by Kam et al. (2009)¹⁹, and Hebrew by Oron et al. (2011)²⁰. Currently, there are no tinnitus questionnaires in Filipino.

Since there are currently no available tinnitus-specific questionnaires in Filipino and there are currently no available data on the effects of tinnitus on the quality of life of Filipino tinnitus patients, there is a need for a valid tinnitus questionnaire in the language.

A Filipino tinnitus questionnaire will help quantify the effects of tinnitus on the quality of life of Filipino tinnitus patients, assist clinicians in justifying their decision for tinnitus therapy or in making the appropriate referrals, and can be used to objectively classify tinnitus patients into the three categories described by Tyler et al. (2008) - curious, concerned, and distressed - and help in determining which type of intervention would be most appropriate²¹.

The THI by Newman is psychometrically robust, easy to administer and interpret, and broad in scope. It is widely used in clinical practice abroad and would serve as an effective tool to use in the local setting¹⁶. A valid and reliable Filipino translation of the THI will help assess the effects of tinnitus on non-English speaking Filipinos and those with poor English skills. As of 2010, the Philippine Overseas Employment Administration estimated the number of Filipinos working abroad to be around 9.5-12 million as of 2010²². A validated THI in Filipino can also be used by these Filipinos abroad who prefer to answer questionnaires in their native language.

METHODOLOGY

The study is a cross-sectional psychometric validation of the THI by Newman. The THI is a 25-item self-report of tinnitus handicap developed by Newman et al. in 1996 to possibly assess the effectiveness of tinnitus treatments. It is composed of three subscales, namely, the functional subscale with 12 items to address role and physical functioning, the emotional subscale with eight items to address psychological distress, and the catastrophic response subscale with five items to address desperation and loss of control⁹.

RESULTS

Each question can be answered by a “yes” which is given four points, a “sometimes” which is given two points, or a “no” which is given zero points. The total score could range from zero, indicating no tinnitus handicap, to 100 indicating the worst annoyance from tinnitus possible. A five-point grading system was proposed by McCombe et al. in 2001²³ based on scores on the THI.

The final version of the Filipino THI was administered to 75 patients, 38 females and 37 males, ages 18 - 82 (mean age = 47.6) recruited consecutively at the Ear Unit of the Philippine General Hospital from February to mid-March 2010 after being assessed at the ENT-OPD. Patients with dizziness, vertigo, and mental retardation were excluded. Informed consent was obtained from all subjects before testing.

Tinnitus pitch and loudness matches were determined using the two-alternative forced-choice method described by Vernon²⁴. An AD 229b (Interacoustics) audiometer was used. A pair of tones was presented and the subject was asked to identify which tone best matches the pitch of their tinnitus. Loudness matches were tested by using the bracketing approach with 1 - dB increments²⁵.

The tones were presented in the ear contralateral to the predominant or louder tinnitus. If the tinnitus was equally loud in both sides, the ear with the better hearing was the test ear. If there was no difference in hearing acuity, the test ear was chosen randomly.

Validation Procedure

The original version of the THI (THI-US) was first translated into Filipino by three native speakers of Filipino bilingual in English. The three translations were then combined and the final version was back-translated into English by an English speaker who was unfamiliar with the THI-US. After comparing the THI-US and the back translation for coherence and making the appropriate revisions, the THI-PH and a tinnitus information sheet (Appendix B) were given to patients. The patients were asked for feedback on the questionnaire and the appropriate revisions were then made.

The final THI-PH was then given to 75 tinnitus patients referred at the Ear Unit of PGH for audiologic testing after assessment at the ENT-OPD of PGH. All study subjects were asked to sign an informed consent form. The nature of the study was explained to all participants. Those who refused to participate or opted to discontinue their participation were excluded from the study. All findings were kept confidential.

After data collection, the internal consistency reliability of the questionnaire's subscales and its overall reliability were analyzed by computing for intra-class and inter-item correlation coefficients and Cronbach's Coefficient Alpha using STATA v.6.0.

Cronbach's alpha for the THI-PH total and its subscales compared to the THI-US and its subscales are given in Table 3. The THI-PH's Cronbach's alpha for the total scale is only slightly lower than the original version. The reliability coefficients of the THI-PH subscales are also comparable to the original THI-US.

Table 3. Cronbach's alpha of total scale and subscales of thi-ph and thi-us.

	Average inter-item covariance	Cronbach's alpha THI-PH	Cronbach's alpha THI-US
Over-all	0.90	0.92	0.93
Functional	0.96	0.86	0.86
Emotional	1.00	0.82	0.87
Catastrophic	0.72	0.63	0.68

The mean PTA hearing threshold, calculated over 0.5, 1, 2 and 4 kHz across both ears, ranged from 10.0 to 120.0 dB HL (mean = 48.9 dB). In the majority of cases (77 per cent) the audiograms revealed bilateral sloping high-frequency hearing losses. Only three patients (4 per cent) had bilateral normal hearing (PTA \leq 25 dB HL). Three (4 per cent) showed a unilateral sensorineural hearing loss. Two (3 per cent) showed a unilateral conductive loss. Two (3 per cent) showed a unilateral mixed hearing loss and seven patients had bilateral conductive hearing losses.

A majority of the subjects (46 per cent) were 46-65 years old followed by those in the 26-45 year-old age range (33 per cent), those in the 65 years and older followed (11 per cent), while the lowest concentration of subjects was found in the 18-25 year-old age range (9 per cent).

Tinnitus Characteristics

A majority of the subjects (68 per cent) suffered from chronic tinnitus (tinnitus for more than six months). In 52 per cent of the cases (39 patients), tinnitus was reported as a secondary symptom, while the remaining 48 per cent (36 patients) cited tinnitus as a chief complaint.

Most of the patients suffered from unilateral tinnitus (68 per cent), more reporting it in the left ear than in the right, 28 per cent suffered from bilateral tinnitus, while four per cent complained that their tinnitus was heard “in the head.”

In terms of tinnitus sounds reported, a majority of the patients claimed that their tinnitus was either insect-like or wind-like.

Tinnitus pitch was most frequently matched at 2,000 Hertz while loudness was most frequently matched at 0-10 decibels sensation level.

Tinnitus Handicap

A non-significant correlation was found between the duration of the tinnitus and tinnitus handicap scores (p -value = 0.34). A majority of the cases were moderate (31 per cent), followed by mild (24 per cent), slight and severe (16 per cent each), and catastrophic (13 per cent). In males, a majority of the cases were concentrated in the Moderate and Severe grades while in females most of the cases were either Moderate or Mild (Table 1).

Table 1. Percentage distribution of tinnitus handicap in relation to gender.

Tinnitus grade	Gender			
	Male		Female	
	Frequency	%	Frequency	%
Slight	4	5.26	8	10.53
Mild	7	9.21	11	14.47
Moderate	12	15.79	11	14.47
Severe	9	11.84	3	3.95
Catastrophic	5	6.58	5	6.58

In terms of age, across all tinnitus handicap grades, most of the cases affected were in the 46-65 year-old age range except for the severe grade where a majority of the cases were in the 26-45 year-old age range (Table 2).

For the tinnitus sounds reported in relation to tinnitus handicap, in the moderate level, a majority of the patients reported their tinnitus to be insect-like while in the severe level they reported it to be wind-like. In the catastrophic level, a majority of the patients reported their tinnitus to be similar to a whistling sound.

For the pitch and loudness matches, in the mild and catastrophic grades, pitch was mostly matched at 2,000 Hertz while in the severe grade, pitch was most frequently matched at 1,000 Hertz (Figure 1). Almost all loudness matches across all handicap grades were at 0-10 decibels sensation level (SL) except for the severe grade where the loudness was most commonly matched at 11-20 dB SL (Figure 2).

Table 2. Percentage distribution of tinnitus handicap in relation to age.

Tinnitus grade	AGE							
	18-25 y/o		26-45 y/o		46-65 y/o		> 65 y/o	
	Freq	%	Freq	%	Freq	%	Freq	%
Slight	0	0.00	4	16.00	7	20.00	1	12.50
Mild	1	14.29	7	28.00	8	22.86	2	25.00
Moderate	5	71.43	5	20.00	11	31.43	2	25.00
Severe	1	14.29	7	28.00	3	8.57	1	12.50
Catastrophic	0	0.00	2	8.00	6	17.14	2	25.00

DISCUSSION

Findings of the present study suggest that the Filipino version of the THI has good internal consistency reliability for both the total scale (Cronbach's alpha = 0.92) and the three subscales (Functional scale: Cronbach's alpha = 0.86, Emotional scale: Cronbach's alpha = 0.82, Catastrophic scale: Cronbach's alpha = 0.63).

Table 4 shows that the results obtained are similar to the original version and also to other language validations.

The slightly poorer internal consistency reliability for the Catastrophic subscale is attributed to the shorter number of items in that scale. This is similar to the results achieved by the original THI-US validation (Cronbach's alpha = 0.68), and the Italian validation (Cronbach's alpha = 0.63). This problem could be resolved by adding items to the catastrophic subscale to increase the alpha.

Findings in terms of the prevalence of tinnitus as a function of age are similar to the findings of Hinchcliffe (1961)²⁶, who concluded that tinnitus was most prevalent in the 55-64 year old age range and was least prevalent in the 18-24 year old age range.

Tinnitus being more frequently experienced in the left ear compared to the right was previously reported by Axelsson and Ringdahl (1989)²⁷, Hazell (1981)²⁸ and Coles (1984)²⁹. They postulated that this could be due to a number of factors including handedness and asymmetrical noise exposure. Tyler (2000) stated that the relationship between these factors and the left-sidedness of the tinnitus was eventually proven to be insignificant. He suggested that more detailed research studies be done to investigate the concept of left versus right ear differences³⁰.

The THI-PH seems to be unaffected by age, sex, and hearing loss. The same observations were noted for the original, Danish, Italian, and Hebrew versions. As stated by Monzani, et al., this adds to the general, cross-cultural validity of the tool as a measure of perceived tinnitus handicap¹⁷.

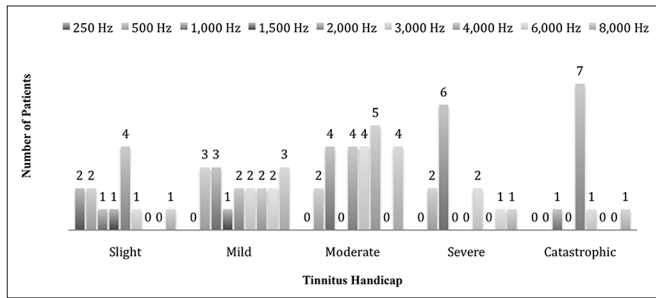


Figure 1. Pitch Matches in Relation to Tinnitus Handicap.

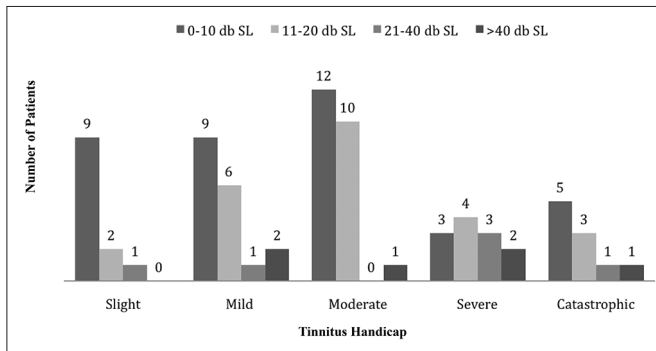


Figure 2. Loudness Matches in Relation to Tinnitus Handicap.

Table 4. Comparison of internal consistency reliability coefficients for the thi-ph and other thi validations.

THI Validation	Cronbach's alpha
THI-US	0.93
THI-Danish	0.93
THI-Spanish	0.90
THI-Korean	0.79 - 0.95
THI-Portuguese	0.94
THI-German	0.93
THI-Turkish	0.88
THI-Italian	0.91
THI-Chinese (Cantonese)	0.72 - 0.94
THI-Hebrew	0.93
THI-PH	0.92

Since the design of this study did not allow for the testing of the questionnaire's repeatability, it is recommended that the THI-PH be tested on another set of patients.

It would also be interesting to investigate the relationship between the THI-PH and psychopathological problems for the subset of patients with catastrophic tinnitus.

CONCLUSION

In conclusion, the results of the study suggest that the THI-PH is a valid and reliable tool that can be used

on Filipino patients to quantify the effects of tinnitus on daily living and to test the efficacy of tinnitus treatments.

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