



Tinnitus assessment: Chinese version of the Tinnitus Primary Function Questionnaire

Ying Xin¹ | Richard Tyler² | Zi-Ming Yao¹ | Na Zhou¹ | Shan Xiong¹ |
Li-Yuan Tao³ | Fu-Rong Ma¹ | Tao Pan¹

¹Department of Otolaryngology, Peking University Third Hospital, Beijing, China

²Department of Otolaryngology-Head and Neck Surgery, University of Iowa, Iowa City, Iowa, USA

³Department of Epidemiology, Peking University Third Hospital, Beijing, China

Correspondence

Tao Pan, Department of Otolaryngology, Peking University Third Hospital, No. 49 Garden North Rd, Haidian District, Peking, China.
Email: pantao6422@163.com

Funding information

Natural Science Foundation of China, Grant/Award Number: 81500783; Scientific Research Foundation for the Returned Overseas Chinese Scholars, Grant/Award Number: 6848901

Abstract

Objective: The aim of this study is to evaluate the Chinese Version of the Tinnitus Primary Function Questionnaire (TPFQ).

Methods: One hundred and sixteen patients who had been suffering from tinnitus for over 3 months were included in this study. Those tinnitus patients were administered the TPFQ, the Tinnitus Handicap Inventory (THI), the Beck Anxiety Inventory (BAI), the Beck Depression Inventory (BDI), and the Pittsburgh Sleep Quality Index (PSQI). Additionally, the magnitude estimate of tinnitus loudness, pure tone audiogram, and tinnitus matching was obtained. The factor structure was measured using the Kaiser–Meyer–Olkin test. The internal consistency was examined using Cronbach's α coefficient. The relationships between the TPFQ scores and other measurements were compared using Spearman's rank correlation coefficient.

Results: The Cronbach's α of the 20-item version of TPFQ was 0.94, and that of the 12-item version of TPFQ was 0.92. Both the 20- and 12-item versions of TPFQ were significantly correlated with magnitude estimation of tinnitus loudness, THI, PSQI, BDI, and BAI. The average pure tone hearing threshold was significantly correlated with the hearing subscale.

Conclusion: The 20- and 12-item Chinese versions of TPFQ are reliable and valid measures of tinnitus. The TPFQ can be applied to the assessment and management of tinnitus among the Chinese-speaking population.

KEYWORDS

questionnaire, reliability, Tinnitus, Tinnitus Primary Function Questionnaire

INTRODUCTION

Tinnitus is a common clinical symptom, and the influencing factors of tinnitus are complex and diverse. Tinnitus cannot be eliminated. The core of tinnitus treatment focuses on reduction of its impact. There

are many treatments for tinnitus, including counseling, sound therapy, and hearing aids. Counseling is even available on the Internet.^{1,2} Therefore, comprehensive evaluation of the impact of tinnitus on patients is an important part of tinnitus treatment. A tinnitus questionnaire is a common method of guiding treatments and

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2022 The Authors. World Journal of Otorhinolaryngology - Head and Neck Surgery published by John Wiley & Sons Ltd on behalf of Chinese Medical Association.

evaluating tinnitus research. Several questionnaires are widely used all over the world, including the Tinnitus Handicap Questionnaire (THQ),³ the Tinnitus Handicap Inventory (THI),⁴ the Tinnitus Primary Function Questionnaire (TPFQ),⁵ the Tinnitus Reaction Questionnaire (TRQ),⁶ and the Tinnitus Questionnaire (TQ).⁷ Everyone may have different reactions to tinnitus, including impaired sleep, difficulty in concentrating, decreased social enjoyment, and interference with hearing.⁸ The THI has been widely used in China;⁹ however, it cannot distinguish these different reactions. Therefore, it cannot play a guiding counseling in the treatment of tinnitus. Furthermore, the three-label category scale is not useful in the treatment of tinnitus.¹⁰ The Tinnitus Primary Function Questionnaire (TPFQ) is developed to guide treatment and research and has been widely used worldwide. Subjects are asked to provide ratings using a scale ranging from 0 (strongly disagree) to 100 (strongly agree). Each item is scored in a wide range (a 0–100 interval scale), making it more likely to detect minor changes. TPFQ has four subscales: concentration, emotion and thoughts, hearing, and sleep. It can evaluate the impacts of tinnitus more comprehensively and can indicate the treatment. TPFQ was once called TAQ, and it was translated into Chinese by Pan et al.¹¹ Factor analysis was used to test the reliability of the Chinese version of TAQ, but the reliability and validity of each dimension of the scale were not tested.¹¹ The aim of this study is to comprehensively validate whether TPFQ can be used in Chinese-speaking patients and whether it can provide evidence for its research and clinical application.

METHODS

The original version of TPFQ was adapted to a cross-cultural Chinese setting. The main steps included forward–backward translation and cognitive debriefing, resulting in a final Chinese version of TPFQ. A Chinese translation of the scale is provided on the website of the University of Iowa, but it does not provide details of the translation. The original TPFQ was translated by two independent otologists, who were Chinese native speakers, with an advanced level of competence in English, and had not read the Chinese translation of TPFQ on the website. Three senior otologists who had extensive experience in the management of tinnitus compared and discussed the three translated editions. Each expert received an evaluation questionnaire. Each item of the questionnaire was evaluated separately, which ranged from 0 (inaccurate translation) to 10 (excellent translation). If all three raters assigned a score less than 8, the translation was rejected and a new translation was required. If the highest score of each item was higher than 8, then the translation of each item was agreed upon. This version was then back-translated by two Chinese-speaking otologists who were unaware of the original questionnaire. The authors compared them with the original version of TPFQ and concluded that there had been no significant difference in any aspect. Ten adult tinnitus outpatients were selected randomly to fill out the Chinese version of TPFQ. The average

Key points

- Both the 20- and 12-item versions of the Chinese Tinnitus Primary Function Questionnaire can be used in Chinese-speaking patients.
- The four subscales can help evaluate tinnitus patients comprehensively.

time to fill out the questionnaire was 5 min. The patients reported that they had no difficulty in understanding the items of the questionnaire and stated that they believed that the questionnaire included important issues related to tinnitus. This resulted in the final Chinese version of TPFQ (Supporting Information: Appendix 2) to be evaluated.

One hundred and sixteen patients visited our clinic (Department of Otolaryngology, Peking University Third Hospital) for tinnitus from June 2013 to December 2015, and were included in this study. The study was conducted on 116 patients, 54 (46.6%) males and 62 (53.4%) females, with a mean age of 48.3 ± 15.7 years. The mean duration of tinnitus was 18 months (range: 3–360 months). The other subject characteristics are presented in Table 1.

The authors applied TPFQ, THI, magnitude estimation of tinnitus loudness, the Beck Anxiety Inventory (BAI),¹² the Beck Depression Inventory (BDI),¹³ and the Pittsburgh Sleep Quality Index (PSQI)¹⁴ for all the tinnitus patients. All patients underwent a physical examination in the Otorhinolaryngology Department to rule out middle-ear

TABLE 1 Characteristics of the subjects.

Item	n	Mean \pm SD
PTA bilateral average (dB HL)	111	22.80 \pm 13.57
Loudness matching	105	10.69 \pm 8.52
Pitch matching (Hz)	108	4755.06 \pm 2402.43
PSQI total score	116	7.63 \pm 4.60
BAI total score	115	32.48 \pm 10.35
BDI total score	115	7.17 \pm 7.32
TPFQ concentration factor score	116	25.64 \pm 28.09
TPFQ emotional factor score	116	45.34 \pm 27.27
TPFQ hearing factor score	116	26.96 \pm 28.81
TPFQ sleep factor score	115	29.05 \pm 30.98
TPFQ total score	115	31.87 \pm 24.59
THI total score	112	35.54 \pm 23.25
Tinnitus loudness (0–10)	115	4.96 \pm 2.22

Abbreviations: BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; PTA, pure tone average (500, 1000, 2000, and 4000 Hz); PSQI, Pittsburgh Sleep Quality Index; THI: tinnitus handicap inventory; TPFQ: Tinnitus Primary Function Questionnaire.

infection. Pure-tone audiogram, tinnitus pitch, and loudness matching were performed at the same clinic visit. This study was approved by the Ethics Committee of Peking University Third Hospital and abided by the International Research Codes of the Declaration of Helsinki.

SPSS version 20.0 (IBM) was used for statistical evaluation. The factor structure of the questionnaire was measured using the Kaiser–Meyer–Olkin (KMO) test. The internal consistency was examined using Cronbach's α coefficient. The relationships between the TPFQ scores and other measurements were compared using Spearman's rank correlation coefficient.

RESULTS

Reliability

The internal consistency of the Chinese TPFQ was examined using Cronbach's α coefficient. The total TPFQ Cronbach's α was 0.94. The Cronbach's α values of factor Concentration, factor Emotion, factor Hearing, and factor Sleep were, respectively, 0.88, 0.80, 0.87, and 0.91. Table 2 shows the item score and the item–total correlation for the 20-item version. The item–total correlation ranged from 0.48 to 0.74, and the median value was 0.66.

Factor structure

One step was to examine the factor structure of the questionnaire using factor analysis techniques (Table 3). The KMO measure was used, and a KMO ratio of 0.97 was obtained for a set of 20 items. The first factor included items 2, 3, 9, 14, and 17 and explained 20.65% of the total variance (eigenvalue = 4.13); the second factor included items 5, 13, 16, 18, and 20 and explained 19.14% of the total variance (eigenvalue = 3.83); the third factor included items 7, 10, 11, 12, 15, and 19 and explained 19.05% of the total variance (eigenvalue = 3.81); and the fourth factor included items 1, 4, 6, and 8 and explained 11.79% of the total variance (eigenvalue = 2.36). The communality of each variable explained by these four factors ranged from 0.37 to 0.83.

Construct validity

A Spearman's correlation coefficient was calculated by comparing the total score of TPFQ with tinnitus loudness magnitude estimation and THI. As shown in Table 4, the correlation between TPFQ and loudness magnitude estimation was 0.42, and a high correlation of 0.73 was found between TPFQ and THI. The scores of PSQI, BAI, BDI, and other characteristics with the total TPFQ and subscale scores were also compared. The total TPFQ, Concentration, Emotion, and Sleep subscales correlated significantly with the PSQI ($r = 0.43, 0.32, 0.35, \text{ and } 0.56; P < 0.01$). The total TPFQ, Concentration, Emotion, Hearing, and Sleep

TABLE 2 Item score and item–total correlation for the TPFQ.

Item	Mean \pm SD	Item–total correlation
1	51.78 \pm 39.68	0.74**
2	28.36 \pm 36.07	0.55**
3	18.36 \pm 29.67	0.66**
4	24.76 \pm 33.41	0.48**
5	35.95 \pm 38.91	0.61**
6	40.91 \pm 41.13	0.68**
7	27.50 \pm 34.65	0.71**
8	32.46 \pm 36.06	0.70**
9	18.92 \pm 31.37	0.58**
10	39.01 \pm 38.34	0.71**
11	23.23 \pm 33.06	0.68**
12	78.72 \pm 35.03	0.53**
13	38.66 \pm 40.30	0.62**
14	24.05 \pm 35.43	0.65**
15	27.63 \pm 35.36	0.70**
16	30.69 \pm 37.24	0.74**
17	22.54 \pm 33.63	0.69**
18	15.04 \pm 29.80	0.61**
19	31.47 \pm 36.67	0.63**
20	23.66 \pm 34.06	0.58**

Abbreviations: SD, standard deviation; TPFQ, Tinnitus Primary Function Questionnaire.

* $P < 0.05$; ** $P < 0.01$.

subscales correlated with the BAI and the BDI ($P < 0.01$). The Hearing subscale was correlated with the bilateral average pure tone average (PTA) ($r = 0.21; P < 0.05$). There was no significant correlation between tinnitus pitch and loudness matching with the TPFQ.

The 12-item Chinese version of TPFQ

A short 12-item version of TPFQ was also provided.⁵ In the 12-item version, questions 7, 11, and 15 were chosen for Concentration; questions 4, 8, and 10 were chosen for Emotion; questions 2, 14, and 17 were chosen for Hearing; and questions 16, 18, and 20 were chosen for Sleep.⁵ The authors also evaluated the 12-Item version TPFQ. Table 5 shows the mean total and subscale scores of the 12-item version. The mean total score of the 12 items was 26.58, and the mean subscale scores ranged from 23.13 to 32.07. The mean scores of the 12-item version were slightly below the 20-item version in the total scale and Emotion, Hearing, and Sleep subscales.

TABLE 3 Results of factor analysis using principal components extraction.

Item	Communality		
1 My tinnitus is annoying.	0.58		
2 My tinnitus masks some speech sounds.	0.78		
3 When there are lots of things happening at once, my tinnitus interferes with my ability to attend to the most important thing.	0.73		
4 My emotional peace is one of the worst effects of my tinnitus.	0.70		
5 I have difficulty getting to sleep at night because of my tinnitus.	0.81		
6 The effects of tinnitus on my hearing are worse than the effects of my hearing loss.	0.60		
7 I feel like my tinnitus makes it difficult for me to concentrate on some tasks.	0.80		
8 I am depressed because of my tinnitus.	0.82		
9 My tinnitus, not my hearing loss, interferes with my appreciation of music and songs.	0.63		
10 I am anxious because of my tinnitus.	0.71		
11 I have difficulty focusing my attention on some important tasks because of tinnitus.	0.81		
12 I just wish my tinnitus would go away. It is so frustrating.	0.37		
13 The difficulty I have sleeping is one of the worst effect of my tinnitus.	0.83		
14 In addition to my hearing loss, my tinnitus interferes with my understanding of speech.	0.79		
15 My inability to think about something undisturbed is one of the worst effects of my tinnitus.	0.72		
16 I am tired during the day because my tinnitus has disrupted my sleep.	0.72		
17 One of the worst things about my tinnitus is its effect on my speech understanding, over and above any effect of my hearing loss.	0.78		
18 I lie awake at night because of my tinnitus.	0.71		
19 I have trouble concentrating while I am reading in a quiet room because of tinnitus.	0.51		
20 When I wake up in the night, my tinnitus makes it difficult to get back to sleep.	0.76		
Factor	Eigenvalue	Percent of variance	Cumulative % of variance
1	4.13	20.65	20.65
2	3.83	19.14	39.79
3	3.81	19.05	58.85
4	2.36	11.79	70.64

Note: The communality is the sum of the squared correlations between a variable and each of the four factors.

Reliability

The internal consistency of the 12-item Chinese version of TPFQ was also examined using Cronbach's coefficient alpha. The total 12-item version of TPFQ Cronbach's α was 0.92. The Cronbach's α values of factor Concentration, factor Emotional, factor Hearing, and factor Sleep were, respectively, 0.90, 0.79, 0.88, and 0.84. The 12-item version of the questionnaire also demonstrates good reliability.

Construct validity

A Spearman's correlation coefficient was calculated to compare the results of tinnitus loudness magnitude estimation, THI, PSQI, BDI, BAI, and the bilateral average PTA with the short version total score and subscale scores (Table 6). The total score and subscale scores from the 12-item version were significantly correlated with tinnitus loudness magnitude estimation, THI, PSQI, BDI, and BAI. The bilateral average PTA was significantly correlated with the Hearing subscale ($r = 0.24$, $P < 0.05$).

DISCUSSION

The results of this study demonstrated that the Chinese version of TPFQ had good reliability. The Cronbach's α values of the total Chinese TPFQ for the factors of Concentration, Emotion, Hearing, and Sleep were 0.94, 0.88, 0.80, 0.87, and 0.91, respectively. This was similar to the English version of TPFQ (0.92, 0.88, 0.84, 0.81, and 0.94).⁵ The high Cronbach's α suggests better internal consistency reliability for this questionnaire. The Chinese TPFQ items showed moderate correlations with the total score of the questionnaire, similar to the English version.⁵

The original TPFQ has four subscales, namely, Concentration, Emotion and thought, Hearing, and Sleep. The factor analysis in the Chinese version also found four factors, but the items in the subscales are slightly different from the original TPFQ. Factor 1 in the Chinese version addresses the influence of tinnitus on hearing, language comprehension, and judgment and can be summarized as the Language and Perception. Factor 2 in the Chinese version addresses Sleep, which is consistent with the original version. Factor 3 in the Chinese version addresses Emotions and Concentration. Factor 4 in the Chinese version addresses Emotion and Hearing. In the Chinese version, the effects of tinnitus on emotion, concentration, and hearing are intertwined and mutually influenced. Emotion, concentration, and hearing are all very important reactions to tinnitus. They are closely related to each other and influence each other. There are similar situations in other questionnaire tests.¹⁵

The authors used correlations between the TPFQ and the loudness magnitude estimation, THI, PSQI, BDI, BAI, bilateral average PTA, pitch matching, and loudness matching as measures

TABLE 4 Spearman's correlation coefficients of TPFQ (total score and subscale scores).

		TPFQ total	Concentration	Emotion	Hearing	Sleep
Loudness magnitude estimation	<i>r</i>	0.42**	0.34**	0.35**	0.43**	0.32**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	114	115	115	115	114
THI	<i>r</i>	0.73**	0.70**	0.73**	0.56**	0.56**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	111	112	112	112	111
PSQI total score	<i>r</i>	0.42**	0.32**	0.35**	0.18	0.56**
	<i>P</i>	0.00	0.00	0.00	0.05	0.00
	<i>n</i>	115	116	116	116	115
BAI total score	<i>r</i>	0.46**	0.49**	0.42**	0.36**	0.37**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	114	115	115	115	114
BDI total score	<i>r</i>	0.42**	0.36**	0.41**	0.34**	0.37**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	114	115	115	115	114
PTA bilateral average	<i>r</i>	0.12	0.03	0.11	0.21*	0.05
	<i>P</i>	0.21	0.75	0.25	0.03	0.58
	<i>n</i>	110	111	111	111	110
Pitch matching	<i>r</i>	0.14	0.16	0.12	0.10	0.13
	<i>P</i>	0.16	0.11	0.23	0.29	0.19
	<i>n</i>	107	108	108	108	107
Loudness matching	<i>r</i>	0.16	0.18	0.16	0.11	0.10
	<i>P</i>	0.12	0.06	0.11	0.29	0.33
	<i>n</i>	104	105	105	105	104

Abbreviations: BAI, Beck Anxiety Inventory; PSQI, Pittsburgh Sleep Quality Index; PTA, pure tone average; THI, Tinnitus Handicap Inventory; TPFQ, Tinnitus Primary Function Questionnaire.

* $P < 0.05$; ** $P < 0.01$.

TABLE 5 Mean scores of the 12-item version of TPFQ.

	<i>n</i>	Mean \pm SD
Concentration	116	26.12 \pm 31.479
Emotion	116	32.07 \pm 30.147
Hearing	116	24.99 \pm 31.408
Sleep	116	23.13 \pm 29.502
Total	116	26.58 \pm 25.553

Abbreviations: SD, standard deviation; TPFQ, Tinnitus Primary Function Questionnaire.

of construct validity. The TPFQ and subscale scores were well correlated with the loudness magnitude estimation. The TPFQ did not show any correlation with the tinnitus pitch and loudness match. This finding is similar to the results of other studies.^{3,15,16}

Consistent with the “psychological model of tinnitus,”^{3,15–18} the overall distress is not only influenced by tinnitus loudness but also by the psychological make-up of the patient. Correlations across subjects should not be expected to be high.^{3,15,16}

A moderate correlation was noted between PSQI with the total TPFQ, and the Concentration, Emotions, and Sleep subscales, similar to the English version.⁵ This finding suggests that sleep can also affect the emotion and concentration of tinnitus patients. The total TPFQ and four subscales all moderately correlated with BAI and BDI. This suggests that the Emotion subscale does focus on the emotion. It is reasonable that emotion can also affect the concentration, hearing, and sleep of tinnitus patients. The emotional problem is probably the most important factor in tinnitus patients. The bilateral average PTA correlated with the Hearing subscale. It is often difficult to separate hearing difficulties caused by the hearing loss from those caused by the tinnitus.

TABLE 6 Spearman's correlation coefficients of the 12-item version of TPFQ (total score and subscale scores).

Item	Total	Concentration	Emotion	Hearing	Sleep	
Loudness magnitude estimation	<i>r</i>	0.38**	0.30**	0.25**	0.35**	0.35**
	<i>P</i>	0.00	0.00	0.01	0.00	0.00
	<i>n</i>	115	115	115	115	115
THI	<i>r</i>	0.76**	0.69**	0.70**	0.52**	0.61**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	112	112	112	112	112
PSQI total score	<i>r</i>	0.40**	0.31**	0.36**	0.23*	0.50**
	<i>P</i>	0.00	0.00	0.00	0.01	0.00
	<i>n</i>	116	116	116	116	116
BAI total score	<i>r</i>	0.50**	0.51**	0.47**	0.34**	0.38**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	115	115	115	115	115
BDI total score	<i>r</i>	0.45**	0.35**	0.42**	0.35**	0.42**
	<i>P</i>	0.00	0.00	0.00	0.00	0.00
	<i>n</i>	115	115	115	115	115
PTA bilateral average	<i>r</i>	0.12	0.06	0.03	0.24*	0.11
	<i>P</i>	0.23	0.52	0.75	0.01	0.23
	<i>n</i>	111	111	111	111	111

Abbreviations: BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; PSQI, Pittsburgh Sleep Quality Index; PTA, pure tone average; THI, tinnitus handicap inventory; TPFQ, Tinnitus Primary Function Questionnaire.

* $P < 0.05$; ** $P < 0.01$.

The Chinese version of TPFQ was well correlated with the Chinese translated THI. In the clinic, we found that sometimes THI cannot be used to assess the tinnitus patients comprehensively. Patients do report impaired sleep, difficulty in concentrating, decreased social enjoyment, and interference with hearing.⁸ Everyone can have different reactions to tinnitus, and they are affected differently by tinnitus. The THI cannot distinguish these differences and cannot play a guiding role in the treatment of tinnitus.

The scaling method of TPFQ is different from THI. THI uses "yes, sometimes, no." In TPFQ, patients answer a scale from 0 (strongly disagree) to 100 (strongly agree). The wide range scores make it more likely to detect minor changes. The short 12-item version of the questionnaire also demonstrates good reliability and construct validity. This finding is consistent with the study of Lu et al.¹⁹ Factor analysis was used to test the reliability, and the validity of the scale was compared to the THI in this study, but the validity of the subscales was not tested.¹⁹ Our study improves the validity analysis of the subscales. The short version is more convenient for patients, so it is a good choice for outpatients in clinic. However, the mean scores of the 12-item version were slightly below those of the 20-item version in the total scale,

Emotion, Hearing, and Sleep subscales. This suggests that the 20-item version can assess the impacts of tinnitus more accurately and comprehensively. Therefore, if time permits, the 20-item version is still preferred.

CONCLUSION

The present study demonstrates that the 20- and 12-item versions of the Chinese TPFQ are reliable and valid measures for tinnitus treatment. The four subscales can help evaluate tinnitus patients comprehensively. The Chinese TPFQ can be used in the assessment and management of tinnitus among the Chinese-speaking population.

AUTHOR CONTRIBUTIONS

Ying Xin was involved in the methodology of the study, and in writing the original draft of the manuscript. Richard Tyler was involved in writing, review, and editing of the manuscript. Zi-Ming Yao and Na Zhou were involved in resource procurement, software, and investigation in this study. Shan Xiong was involved in writing, review, and editing of the manuscript. Li-Yuan Tao was involved in data curation in this study. Fu-Rong Ma and Tao Pan were involved in project administration.

ACKNOWLEDGMENT

None.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study is available on request from corresponding author provided that there is data sharing agreement approval. The data is not publicly available due to privacy and ethical restrictions.

ETHICS STATEMENT

This study was approved by the Ethics Committee of Peking University Third Hospital and abided by the International Research Codes of the Declaration of Helsinki.

REFERENCES

1. Beukes EW, Manchaiah V, Baguley DM, Allen PM, Andersson G. Process evaluation of Internet-based cognitive behavioural therapy for adults with tinnitus in the context of a randomised control trial. *Int J Audiol*. 2018;57:98-109.
2. Jasper K, Weise C, Conrad I, Andersson G, Hiller W, Kleinstäuber M. Internet-based guided self-help versus group cognitive behavioral therapy for chronic tinnitus: a randomized controlled trial. *Psychother Psychosom*. 2014;83:234-246.
3. Kuk FK, Tyler RS, Russell D, Jordan H. The psychometric properties of a tinnitus handicap questionnaire. *Ear Hear*. 1990;11:434-445.
4. Newman CW, Jacobson GP, Spitzer JB. Development of the Tinnitus Handicap Inventory. *Arch Otolaryngol Head Neck Surg*. 1996;122:143-148.

5. Tyler R, Ji H, Perreau A, Witt S, Noble W, Coelho C. Development and validation of the tinnitus primary function questionnaire. *Am J Audiol.* 2014;23:260-272.
6. Wilson PH, Henry J, Bowen M, Haralambous G. Tinnitus reaction questionnaire: psychometric properties of a measure of distress associated with tinnitus. *J Speech Hear Res.* 1991;34:197-201.
7. Goebel G, Hiller W. The tinnitus questionnaire. A standard instrument for grading the degree of tinnitus. Results of a multicenter study with the tinnitus questionnaire. *HNO.* 1994;42:166-172.
8. Bauer CA. Tinnitus. *N Engl J Med.* 2018;378:1224-1231.
9. Liu P, Gong HH, Ruan ZJ. A study on assessment methodology for evaluating tinnitus gravity. *Chin J Otolaryngol.* 2009;7:186-190.
10. Tyler RS, Oleson J, Noble W, Coelho C, Ji H. Clinical trials for tinnitus: study populations, designs, measurement variables, and data analysis. *Prog Brain Res.* 2007;166:499-509.
11. Pan T, Tyler Richard, Yu Song, et al. Investigation of the influence of tinnitus to patients in their daily life and the reliability test of tinnitus activity questionnaire. *Chin Arch Otolaryngol Head Neck Surg.* 2011;18:667-670.
12. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. *J Consult Clin Psychol.* 1988;56:893-897.
13. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry.* 1961;4:561-571.
14. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res.* 1989;28:193-213.
15. Vanneste S, To WT, De Ridder D. The psychometric properties of the Tinnitus Handicap Questionnaire in a Dutch-speaking population. *Clin Otolaryngol.* 2011;36:9-16.
16. Jun HJ, Yoo IW, Hwang SJ, Hwang SY. Validation of a Korean version of the Tinnitus Handicap Questionnaire. *Clin Exp Otorhinolaryngol.* 2015;8:198-201.
17. Dauman R, Tyler RS. Some considerations on the classification of tinnitus. In: Aran JM, Dauman R, eds. *Proceedings of the Fourth International Tinnitus Seminar.* Kugler Publications; 1992:225-229.
18. Tyler RS, Aran JM, Dauman R. Recent advances in tinnitus. *Am J Audiol.* 1992;1:36-44.
19. Lu T, Liu JH, Li G, et al. Reliability and validity of the mandarin version of the tinnitus primary function questionnaire: a preliminary observational study. *Medicine (Baltimore).* 2019;98:e16104.

How to cite this article: Xin Y, Tyler R, Yao Z-M, et al. Tinnitus assessment: Chinese version of the Tinnitus Primary Function Questionnaire. *World J Otorhinolaryngol Head Neck Surg.* 2023;9:27-34. doi:10.1002/wjo2.60

APPENDIX 1: IOWA TINNITUS PRIMARY FUNCTION QUESTIONNAIRE (20-ITEM VERSION)

Please indicate your agreement with each statement on a scale from 0 (completely disagree) to 100 (completely agree).

- 1 My tinnitus is annoying.
- 2 My tinnitus masks some speech sounds.
- 3 When there are lots of things happening at once, my tinnitus interferes with my ability to attend to the most important thing.
- 4 My emotional peace is one of the worst effects of my tinnitus.
- 5 I have difficulty getting to sleep at night because of my tinnitus.
- 6 The effects of tinnitus on my hearing are worse than the effects of my hearing loss.
- 7 I feel like my tinnitus makes it difficult for me to concentrate on some tasks.
- 8 I am depressed because of my tinnitus.
- 9 My tinnitus, not my hearing loss, interferes with my appreciation of music and songs.
- 10 I am anxious because of my tinnitus.
- 11 I have difficulty focusing my attention on some important tasks because of tinnitus.
- 12 I just wish my tinnitus would go away. It is so frustrating.
- 13 The difficulty I have sleeping is one of the worst effect of my tinnitus.
- 14 In addition to my hearing loss, my tinnitus interferes with my understanding of speech.
- 15 My inability to think about something undisturbed is one of the worst effects of my tinnitus.
- 16 I am tired during the day because my tinnitus has disrupted my sleep.
- 17 One of the worst things about my tinnitus is its effect on my speech understanding, over and above any effect of my hearing loss.
- 18 I lie awake at night because of my tinnitus.
- 19 I have trouble concentrating while I am reading in a quiet room because of tinnitus.
- 20 When I wake up in the night, my tinnitus makes it difficult to get back to sleep.

APPENDIX 2: THE CHINESE VERSION OF THE TINNITUS PRIMARY FUNCTION QUESTIONNAIRE (20-ITEM VERSION)

说明:请根据每个问题的严重程度填写您的评分(0到100间的任何数字)。0表示表示您极不赞同, 100表示您极赞同。

1	耳鸣令我极其烦恼。
2	耳鸣影响我听语言。
3	当有很多事情突然发生时, 耳鸣干扰我判断哪件事情最重要。
4	我情绪的稳定是耳鸣影响最大的一方面。
5	因为耳鸣, 我晚上睡觉困难。
6	耳鸣对我听力的影响比听力下降本身更严重。
7	我感觉耳鸣使我难于集中精力做一些工作。
8	因为耳鸣我情绪低落。
9	耳鸣影响我欣赏音乐和歌曲, 而不是耳聋。
10	因为耳鸣, 我很焦虑。
11	因为耳鸣, 我不能集中精力做一些重要的事情。
12	我就希望耳鸣消失, 它太影响我了。
13	耳鸣对我最严重的影响是睡觉困难。
14	除了耳聋以外, 耳鸣也影响我对语言的理解。
15	耳鸣最严重的影响是我不能够不受干扰地思考一些问题。
16	耳鸣影响我睡觉, 使我整天疲惫。
17	耳鸣最严重的影响是干扰我对语言的理解. 这超过了听力下降对语言理解的影响。
18	因为耳鸣, 我整夜不能入睡。
19	因为耳鸣, 我不能在安静的房间内集中精力阅读。
20	当我晚上醒来, 耳鸣使我不能再入睡。

APPENDIX 3: THE CHINESE VERSION OF THE TINNITUS PRIMARY FUNCTION QUESTIONNAIRE (12-ITEM VERSION)

说明:请根据每个问题的严重程度填写您的评分(0到100间的任何数字)。0表示表示您极不赞同, 100表示您极赞同。

	原条目
注意力	
1	我感觉耳鸣使我难于集中精力做一些工作。 7
2	因为耳鸣, 我不能集中精力做一些重要的事情。 11
3	耳鸣最严重的影响是我不能够不受干扰地思考一些问题。 15
情绪	
4	我情绪的稳定是耳鸣影响最大的一方面。 4
5	因为耳鸣我情绪低落。 8
6	因为耳鸣, 我很焦虑。 10
听力	
7	耳鸣影响我听语言。 2
8	除了耳聋以外, 耳鸣也影响我对语言的理解。 14
9	耳鸣最严重的影响是干扰我对语言的理解, 这超过了听力下降对语言理解的影响。 17
睡眠	
10	耳鸣影响我睡觉, 使我整天疲惫。 16
11	因为耳鸣, 我整夜不能入睡。 18
12	当我晚上醒来, 耳鸣使我不能再入睡。 20