Auditory and Vestibular Research

Reliability and validity of the Persian version of the 12-items Tinnitus Primary Function Questionnaire

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Highlights

- The P-TPFQ-12 demonstrated excellent content and face validity indices.
- The scale exhibited outstanding internal consistency and test–retest reliability.
- Strong correlations with THI and moderate associations with depression and sleep.

Abstract

Background and Aim: Tinnitus, the perception of sound without an external source, creates social, psychological, and economic challenges. Questionnaires are widely used to assess its impact on daily life. This study aimed to translate and validate the Persian version of the 12-item Tinnitus Primary Function Questionnaire (P-TPFQ-12) to provide a culturally appropriate tool for evaluating tinnitus-related disability in Persian speakers.
Methods: A cross-sectional study was conducted with 56 adults experiencing chronic tinnitus. The P-TPFQ-12 was translated using the International Quality of Life Assessment protocol. Content validity was evaluated using the Content Validity Ratio (CVR) and Content Validity Index (CVI) based on ratings from 10 audiologists. The Face Validity Index (FVI) was calculated with input from 10 experts and 10 patients. Internal consistency was determined using Cronbach's alphaand item–total correlations. Convergent validity was tested by correlating P-TPFQ-12 scores with the Tinnitus Handicap Inventory (THI), Beck Depression Inventory-II (BDI-II), and Pittsburgh Sleep Quality Index (PSQI). Test–retest reliability was assessed with intraclass correlation coefficients (ICC) in 21 participants after two weeks. Confirmatory factor analysis (CFA) examined two structural models.
Results: Content and face validity were excellent (CVR=1.0, CVI=1.0, FVI=1.0). Internal consistency was high (Cronbach's α=0.956 overall; subscales=0.922–0.969). Strong correlations were found with THI (r=0.845), moderate with BDI-II (r=0.600) and PSQI (r=0.416). Test–retest reliability was strong (ICC=0.956). CFA supported a four-factor structure with high loadings (0.85–0.97).
Conclusion: The P-TPFQ-12 showed excellent reliability and validity, confirming its suitability as a concise, multidimensional tool for assessing tinnitus-related disability among Persian speakers.
Keywords: Tinnitus, questionnaries, tinnitus primary functional questionaries, validity, reliability

Introduction

Tinnitus, characterized by the perception of sound in the absence of external or internal auditory stimuli, represents a significant global health concern affecting millions and posing substantial challenges at both individual and societal levels. Subjective tinnitus, the most prevalent form of this condition, is frequently

correlated with hearing impairment, sleep disturbances, and psychological comorbidities, including depression and anxiety. Global prevalence rates for tinnitus are reported to range from 4.6% to 30%, with approximately one percent of affected individuals experiencing severe and debilitating symptomatology. In the United States, tinnitus affects nearly 15% of the general population and 22% of adults over the age of 50 years. It is noteworthy that approximately 90% of tinnitus cases are associated with some degree of hearing impairment [1]. In Iran, a study conducted in 2009 reported a tinnitus prevalence of 4.5%. Although more recent epidemiological data are not available for Iran, it is plausible that the number of individuals experiencing tinnitus may have increased [2]. The identification of tinnitus and the evaluation of its consequences are primarily reliant on patient self-reporting, as there is currently no objective method for directly detecting the presence of tinnitus [3]. However, subjective assessment methodologies, including behavioral evaluations and the administration of questionnaires, are available for investigating tinnitus. These approaches enable researchers and clinicians to gather crucial information regarding the nature and impact of tinnitus on individuals[4]. A well-structured questionnaire facilitates a comprehensive evaluation of the patient's condition, enabling healthcare providers to make informed clinical decisions and monitor treatment progress. Comprehensive questionnaires with validated translations in multiple languages, such as the Tinnitus Handicap Questionnaire (THQ)[5], the Tinnitus Handicap Inventory (THI)[6], and the Tinnitus Functional Index (TFI)[7], are essential for the accurate assessment of tinnitus. Evidence suggests that shorter questionnaires tend to exhibit higher rates of patient compliance, both in hospital and primary care settings [8]. THI is considered a standard outcome measure in clinical trials, facilitating comparisons across studies and ensuring consistency in evaluating treatment effectiveness. The use of the THI as a standardized tool enhances the comparability and reliability of tinnitus severity assessments [9].

The Tinnitus Primary Function Questionnaire (TPFQ) represents an alternative questionnaire designed to provide insights into the intensity and impact of tinnitus on essential daily activities [10]. The TPFQ is specifically designed to be of shorter length compared to the THI questionnaire while maintaining the capacity to capture important aspects related to tinnitus activity and its interference with daily life. This brevity can be advantageous in clinical settings where time constraints are a consideration or when a more focused assessment is desired. The TPFQ facilitates a more efficient evaluation of tinnitus-related activity limitations, rendering it a valuable tool for assessing the impact of tinnitus on individuals. Initially introduced in 2014 by Tyler et al. in two versions, comprising 20 items and 12 items, the TPFQ has since been translated into multiple languages, including Korean[11], Chinese[12], Mandarin [13], Arabic[14], Brazilian[15], Hindi [16] and Persian (20-item version)[17] .

The TPFQ employs positively worded statements pertaining to daily activities, which patients are asked to rate quantitatively based on the perceived impact of each statement on their quality of life. The resultant score provides valuable information regarding the patient's subjective response to tinnitus. The primary objective of the TPFQ is to offer a sensitive instrument for measuring clinical changes and identifying specific areas where patients may benefit from counseling to improve their management of tinnitus response[10].

Although validated Persian-language instruments such as the THI are available for assessing tinnitus severity, they tend to be lengthy and may not be practical in fast-paced clinical environments. The TPFQ with 12-item offers a brief yet multidimensional alternative that captures the functional impact of tinnitus across concentration, emotions, hearing, and sleep.

The present study aimed to translate the original English version of the 12-item Tinnitus Primary Function Questionnaire into the Persian language and Subsequently, the reliability and validity of the P-TPFQ were rigorously examined.

Methods

Participants

The study cohort comprised patients diagnosed with chronic tinnitus, aged between 18 and 70 years, recruited from the tinnitus clinic at Amir Alam Hospital. In this study , the sample size was determined using the subject-to-item ratio rule of thumb , with a minimum of 5 pariticipants per item , as recommended in the literature[18]. In this study, 60 participants were initially included in the study, of which 4 were excluded during the data analysis phase. The final sample size was 56 participants, consisting of 32 males and 24 females. Detailed patient history regarding tinnitus was documented, encompassing tinnitus duration, perceived laterality, and subjective ratings of pitch and loudness. Also, Pure tone audiometry (AC 33, Interacoustic, Denmark; with TDH 39 headphones,

Telephonics, America) were performed for all participants.The pure-tone average (PTA) was calculated as the average of the air conduction thresholds at 0.5, 1, 2, and 4 kHz.
Participant selection was guided by predefined inclusion and exclusion criteria. Inclusion criteria were as follows: (a) age range of 18 to 70 years; (b) absence of neurological disorders such as multiple sclerosis Alzheimer's disease, or dementia; (c) absence of significant dizziness or vertigo; (d) absence of pulsatile tinnitus; (e) tinnitus duration of at least six months[19]; and (f) native Persian language proficiency to ensure accurate comprehension of questionnaires and assessments. Exclusion criteria were: (a) participant excluded from the study due to unwillingness to continue; and (b) occurrence of any issues during the study that could potentially compromise data collection or analysis [10].

Study Design

This study adopted a cross-sectional survey design and development. Initially, permission for translation of the TPFQ was obtained from its originator,Richard Tyler, via email correspondence. Subsequently, the TPFQ underwent a rigorous translation and cultural adaptation process into Persian to ensure semantic and cultural adaptation within the Iranian context. Following translation, the P-TPFQ was subjected to content and face validity assessments. In the subsequent phase, to evaluate convergent validity, participants were administered the Persian versions of the THI [20] , BDI[21], and PSQI[22] questionnaires.

Original questionnaires

The P-TPFQ is a 12-item instrument designed to assess four domains: concentration, emotions, hearing, and sleep. Each item is rated on a continuous scale ranging from 0 (completely disagree) to 100 (completely agree). The total score is derived by averaging the summed scores across the four domains, yielding a potential maximum score of 100, indicative of the highest reported level of tinnitus-related difficulties across all assessed areas [10].

Translation and adaptation of questionnaire:

In the translation process of the Persian version of TPFQ, the study followed the international quality of life assessment (IQOLA) translation protocol [23]. The translation was performed by two expert translators independently, who translated the TPFQ from English to Persian. To assess the similarity and accuracy of the translated questionnaire, the Persian version was then back-translated to English by two other translators. For further confirmation of content matching, the back-translated version was sent to the main author questionnaire for review.

Content validity:

In order to assess the content validity of the Persian version of the questionnaire, two methods were employed: the Content Validity Ratio (CVR) based on the Lawshe method and the Content Validity Index (CVI) using the Waltz and Basel method.

For the CVR calculation, the Persian version of the questionnaire was presented to 10 audiologists. These experts were asked to review each item and categorize them as "essential," "useful but not essential," or "not essential." The CVR was then calculated based on the proportion of experts who rated an item as "essential.The minimum numerical value of CVR for 10 experts, was 0.62 based on Lawshe's table [23].

To assess the CVI, the same group of experts evaluated the relevancy, clarity, and simplicity of each item using a 5-point Likert scale. The CVI was then calculated by determining the proportion of experts who rated an item as either 4 or 5 on the Likert scale for each criterion (relevancy, clarity). Based on the feedback and ratings provided by the experts, necessary corrections were made to the questionnaire. These corrections could include revisions to the wording, clarity, or structure of certain items, ensuring that the questionnaire accurately captures the intended constructs and is understandable to the target population.The minimum acceptable value for CVI for 10 experts, was 0.78 [24].

Face validity:

To evaluate the face validity of the Persian questionnaire, 10 experts and 10 participants assessed its wording, layout, and simplicity using a Likert scale. Feedback and ratings guided revisions. The Face Validity Index (FVI) was calculated based on expert ratings of item simplicity (1 = not simple, 5 = highly simple). Items scoring 4 or 5 were considered acceptable, with FVI computed as:

FVI = Number of experts rating the item as relevant (i.e., 4 or 5) / Total number of experts

An FVI score of 0.78 or higher is generally considered acceptable, indicating adequate face validity[25].

Internal consistency reliability

To determine the internal consistency reliability of the TPFQ-12 questionnaire, Cronbach's alpha coefficient, corrected item-total correlation, and average inter-item correlation were used. Cronbach's alpha coefficient values greater than 0.7 indicate acceptable reliability, while intraclass correlation coefficient (ICC) values falling within the ranges of >0.5, 0.5–0.75, 0.75–0.90, and <0.90 represent weak, moderate, and strong reliability, respectively [25]

Reliability

To investigate test-retest reliability, a subgroup of participants was selected from the larger sample. In this case, two weeks after the initial implementation of the questionnaire, 21 participants were randomly selected and asked to complete the questionnaire again.

Confirmatory factor analysis

To evaluate the factor structure of the questionnaires, confirmatory factor analysis was conducted using the maximum likelihood method based on the variance-covariance matrix. The following indices were utilized in this research: chi-square ($\chi 2$), relative chi-square ($\chi 2/df$), comparative fit index (CFI), normalized fit index (NFI), incremental fit index (IFI), root mean square error of estimation (RMSEA), and standardized root mean square residual (SRMR). In this study, Confirmatory factor analysis (CFA)was performed on different TPFQ-12 models, including a single-factor model, a first-order four-factor model, and a second-order four-factor model.

Convergent validity :

To determine the validity of the P-TPFQ, three additional questionnaires were administered alongside the P-TPFQ.

Persian version of THI questionnaire (P-THI) questionnaire consists of 25 items and 3 subscales: Functional subscale (12 items), Emotional subscale (8 items), and Catastrophic subscale (5 items). These subscales measure physical function, psychological distress, depression, and loss of control, respectively. Each item has three potential responses: 4 points for "yes," 2 points for "sometimes," and 0 points for "no." The total score for the test ranges from 0 (no impairment or annoyance) to 100 (maximum possible impairment). In the full version of THI (0 to 100 points), scores between 0 and 16 indicate no impairment, scores from 18 to 36 indicate mild disability, scores from 38 to 56 indicate moderate disability, scores from 58 to 76 indicate severe disability, and scores from 78 to 100 indicate maximum impairment[20].

Persian version of BDI questionnaire (P-BDI) is a widely used questionnaire designed to assess the severity of depression. It consists of 21 items, and each item is responded using a ranging from 0 to 3. The total score on the P-BDI is calculated by summing the scores of all the items, resulting in a range from 0 to 63. The scoring system of the P-BDI reflects that higher scores indicate a greater level of depression[21].

The PSQI includes 24 questions or items that need to be rated (0 to 3 for 20 items, while 4 items are open-ended). 19 items are self-reported, and 5 items require secondary feedback from a companion [22].

Data analyzing

The current study employed various statistical measures to analyze and present the data. For quantitative variables, the values were expressed as the "mean (standard deviation)" and "median (interquartile range)." Meanwhile, qualitative variables were represented as "frequency (percentage)." The normality of TPFQ-12 scores was assessed using the Shapiro-Wilk test and Kolmogov-Smirnov test. To assess the internal consistency of the TPFQ-12 questionnaire, Cronbach's alpha coefficient was calculated. In addition, intra-item correlation, corrected item-total correlation, and mean inter-item correlation were examined. The test-retest reliability was determined using the ICC.Overall, these statistical measures were employed to assess various aspects of the data, including reliability, normality, and factor structure.

Results:

Participant characterstic:

In this study a total of 56 participants with mean age of ± SD 46.09 ± 14.64 with tinnitus were included. Among them, 32 were male, accounting for 57.1% of the sample, while 24 were female, representing 42.9% of the sample.

The pure-tone thresholds average 500 to 4000 Hz was 28.02 dB HL with 20.67 dB HL SD. Out of the participants, 29 individuals (51.8%) reported experiencing tinnitus in both ears, while 13 individuals (23.2%) reported tinnitus in the right ear and 14 individuals (25%) reported tinnitus in the left ear. In terms of tinnitus type, 40 participants (71.4%) had tonal tinnitus, while 16 participants (28.6%) had noisy tinnitus, evenly distributed between men and women.

Content validity:

The minimum acceptable CVR value, considering the number of experts involved in this research (10 experts), was set at 0.62. All items show a CVR and CVI value of 1, indicating excellent content validity for the questionnaire items.

Face validity:

The face validity assessment relied on the impact score, with the FVI calculated as 1 based on feedback from both experts and participants. The questionnaire achieved an average total score of 5, reflecting its simplicity and confirming a satisfactory level of face validity.

Scoring:

Descriptive statistics for the total score of the TPFQ-12 questionnaire and its subscale scores among participants with tinnitus are presented in Table 1. Among the subscales, concentration exhibited the highest average score, whereas sleep had the lowest.

Reliability

Cronbach's alpha coefficient for the entire scale was 0.956, which was at an excellent level; Cronbach's alpha coefficient for the subscales of concentration, emotions, hearing, and sleep were 0.949, 0.922, 0.969, and 0.936, respectively (Table2). The average inter-item correlation for the entire questionnaire and the subscales of concentration, emotions, hearing, and sleep, which is also reported in Table 2, was at an adequate level.

Test-retest reliability

The results of the test-retest reliability of the questionnaire, using the ICC, are shown in Table 3.

Confirmatory factor analysis

In this study, CFA was performed on different TPFQ-12 models, including a single-factor model, a first-order four-factor model, and a second-order four-factor model. The goodness-of-fit indices indicate that the single-factor model does not fit the data well ($\chi 2/df=6.11$, CFI=0.79, NFI=0.77, IFI=0.79, RMSEA=0.312, and SRMR=0.120). In the case of the first-order four-factor model, the goodness-of-fit indices showed that this model had a good fit with the data ($\chi 2/df=1.96$, CFI=0.95, NFI=0.93, IFI=0.95, RMSEA=0.132[90% confidence interval(CI)=0.11–0.15], and SRMR=0.066), so that the relative chi-square value was less than 2, the CFI, NFI, and IFI indices were greater than 0.90, and the SRMR index was less than 0.08, indicating a good fit of the model with the data. It is worth noting that only the RMSEA index was not in the acceptable range; all standardized factor loadings were significant and in the expected direction, which ranged from 0.85 to 0.97. Almost the same results were obtained for the second-order four-factor model; in other words, similar to the first-order four-factor model, the second-order four-factor model also had a good fit with the data (Figure1).

Convergent validity

A strong and statistically significant positive correlation was found between the total score of the TPFQ-12 questionnaire and the THI total score ($r = 0.845$, $p < 0.001$). Additionally, significant positive correlations were observed between the total score and all TPFQ-12 subscales of the TPFQ-12 with all THI subscales that showed in Table 4. In order to check the relationship between TPFQ-12 scores and BDI-II (depression) and PSQI (sleep quality) total scores, Spearman's correlation coefficient was used. There was a significant positive correlation between TPFQ-12 total score and BDI-II total score ($r=0.600$, $p<0.001$); In other words, as TPFQ-12 scores increased, BDI-II scores generally increased. Also, there was a significant positive correlation between TPFQ-12 total score and PSQI total score ($r=0.416$, $p\leq0.001$). In other words, as TPFQ-12 scores increased, PSQI scores

generally increased (Figure2). Also, weak to strong positive correlations were observed between TPFQ-12 subscale scores and BDI-II and PSQI total scores (Table 5).

Relationship between age of participants and tinnitus primary function questionnaire scores and gender differences

There was no significant relationship between age and TPFQ-12 total score (p=0.916, r=0.014). Also, there was also no statistically significant difference between TPFQ-12 total score of men and women (p=0.649, power = 0.8) .

Discussion

The statistical analyses confirmed that the Persian version of the Tinnitus Primary Function Questionnaire achieved exemplary content validity, with both the CVR and CVI registering values of 1. These results suggest that the translation process successfully preserved the original questionnaire's integrity, as no content modifications were made. This alignment ensures the P-TPFQ retains the content validity of the English version, making it applicable to Persian-speaking populations while maintaining its structural foundation.

Reliability was substantiated with a Cronbach's alpha of 0.956 for the total scale, indicating outstanding internal consistency. Subscale-specific coefficients were 0.949 (concentration), 0.922 (emotions), 0.969 (hearing), and 0.936 (sleep), reflecting robust reliability across domains. While the original English version by Tyler et al. (2014) reported a Cronbach's alpha of 0.89, the Persian adaptation surpasses this, suggesting enhanced consistency possibly due to cultural resonance or refined item selection[10]. However, these high alpha values should be interpreted cautiously; they reflect statistical reliability but not necessarily the qualitative experience of tinnitus severity, which may vary subjectively among respondents.

Critically, convergent validity findings provide robust evidence for the P-TPFQ-12's clinical utility. The strong correlation with THI ($r = 0.845$, $p < 0.001$) aligns with theoretical expectations, as both instruments measure tinnitus-related disability, yet do so through distinct conceptual frameworks—TPFQ focusing on functional domains (concentration, emotions, hearing, sleep) and THI emphasizing handicap perception. This high convergence confirms that the P-TPFQ-12 captures core constructs of tinnitus impact while offering multidimensional granularity. Notably, differential subscale correlations provide nuanced insights: the emotion subscale correlated strongly with BDI-II ($r = 0.66$, $p < 0.01$), validating its sensitivity to affective comorbidities, while the sleep subscale showed the highest association with PSQI ($r = 0.68$, $p < 0.01$), demonstrating specificity to sleep disturbance—a common tinnitus comorbidity. These domain-specific patterns mirror findings in the original validation ($r = 0.77$ with THQ) [10]The observed moderate correlations with BDI-II (r = ٠,٦٠٠) and . PSQI (r = ٠,٤١٦) further reinforce the instrument’s construct validity. These values are clinically meaningful, reflecting that tinnitus-related dysfunction shares variance with—but is not reducible to—depression or sleep pathology alone. This pattern is consistent across cultural adaptations, such as the Chinese TPFQ (BDI r = ٠,٦٥, (PSQI r = ٠,٥١) (12)and Mandarin version (PSQI r = 0.49) [13], underscoring the universal interplay between tinnitus and these domains.Comparisons with other adaptations reveal reliability variability. Shaurya et al.'s Indian version reported a lower Cronbach's alpha of 0.734, suggesting cultural or methodological differences[16], most validations align closely with our findings: The Mandarin (α=0.925; THI r=0.705) [13], Arabic (α=0.806–0.819) [14], Chinese (α=0.92; THI r=0.73)[12], Brazilian Portuguese (α=0.94–0.95)[15],and Korean (α=0.94–0.95)[11] versions all show high internal consistency. This cross-cultural robustness underscores the P-TPFQ’s reliability, though differences may reflect linguistic nuances or sample characteristics.Test-retest reliability, measured by the ICC, was 0.956 overall and 0.922–0.969 across subscales, indicating exceptional temporal stability, consistent with ranges of 0.82–0.95 in other validations[25]. Collectively, these psychometric properties position the P-TPFQ as a reliable and valid instrument for assessing tinnitus-related functional and psychological impacts in Persian-speaking individuals, with implications for enhancing clinical evaluations and informing culturally tailored interventions.

Limitations

The study primarily recruited participants from a single tertiary hospital tinnitus clinic in Tehran. This may introduce selection bias toward individuals with higher tinnitus severity or greater healthcare access, potentially limiting generalizability to community-dwelling populations or those with milder symptoms.

Self-reported measures such as the BDI were potentially influenced by response bias, as some individuals may have withheld honest answers due to personal discomfort or social stigma.
Although the model demonstrated a good fit with the collected data, the sample size was relatively small (56 participants instead of the recommended 60 based on the subject-to-item ratio). It is therefore recommended that future studies replicate the confirmatory factor analysis (CFA) with a larger sample to further strengthen the evidence for the model's validity.

Conclusion:

the Persian version of the TPFQ questionnaire has undergone successful translation and cultural adaptation, and its validation process has demonstrated high reliability and a strong correlation with the THI questionnaire. These findings have important implications for clinical practice and future research in the field of tinnitus. The high reliability of the Persian TPFQ-12 questionnaire indicates that it consistently measures the psychological factors associated with tinnitus. This reliability ensures that clinicians and researchers can confidently use the questionnaire to assess tinnitus-related psychological aspects in Persian-speaking individuals. The questionnaire's reliability is crucial for obtaining accurate and consistent measurements, leading to more reliable clinical assessments, treatment, and research outcomes.

Ethical consideration

Ethical approval was obtained from the University of Medical Sciences with reference number .FNM.REC.1402.033. All participants signed written informed consent forms.

Authors' contributions

AR: Conceptualization, Study design, acquisition of data, interpretation of the results, statistical analysis, drafting and revising the manuscript; VR:Conceptualization, Study design, interpretation of the results, drafting and revising the manuscript; ET: Interpretation of the results and drafting the manuscript; RT: Study design revising the manuscrip, ; MA: acquisition of data, drafting the manuscript

Disclosure

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Table 1-Descriptive indices of tinnitus primary function questionnarie **-12 total score and its subscale scores in participants with tinnitus (n=56)**

TPFQ-12	Possible amounts	Observed amount	mean (SD)	Median
Concentration	0-100	0-100	34.3(31.5)	23.3
Emotions	0-100	0-100	30.7(29.9)	20
Hearing	0-100	0-100	30.3(34.3)	15
Sleep	0-100	0-90	23.3(26)	10
Total score	0-100	0-92.5	29.6(26.4)	20

Table 2: Internal consistency reliability of the tinnitus primary function questionnarie **-12 questionnaire in participants with tinnitus (n=56)**

TPFQ-12 Questionnaire Subscale	Number of Items	Cronbach's Alpha	Corrected Item-Total Correlation	Mean Inter-Item Correlation
Concentration	3	0.949	0.829 – 0.939	0.863
Emotions	3	0.922	0.796 – 0.879	0.799
Hearing	3	0.969	0.919 – 0.947	0.914
Sleep	3	0.936	0.821 – 0.908	0.834
Total Score	12	0.956	0.632 – 0.889	0.638

This table presents the internal consistency reliability statistics for the TPFQ-12 questionnaire, broken down by its subscales and for the total score. The statistics include Cronbach's alpha, the range of corrected item-total correlations, and the mean inter-item correlation for each subscale and the total score.

Table 3 –Intraclass correlation coefficient **values for** tinnitus primary function questionnarie **-12**

TPFQ-12	interclass correlation	95% confidence interval
concentration	.949	**.921-.969**
emotions	.922	**.875-.951**
hearing	.969	**.952-.981**
sleep	.936	**.9-.961**
Total Score	.956	**.937-.971**

ICC values equal to >0.5, 0.5-0.75, 0.75-0.9, and <0.9 indicate poor, moderate, good, and excellent reliability, respectively.

Table 4. Spearman's correlation coefficients between tinnitus primary function questionnarie **-12 scores and** tinnitus handicap inventory **scores in participants with tinnitus (n=56)**

TPFQ-12 Questionnaire Subscale	**THI Questionnaire - Functional**	**THI Questionnaire - Emotional**	**THI Questionnaire - Catastrophizing**	**THI Questionnaire - Total Score**
Concentration	0.820	0.737	0.715	0.819
Emotions	0.832	0.830	0.775	0.867
Hearing	0.588	0.456	0.430	0.546
Sleep	0.654	0.544	0.522	0.623
Total Score (TPFQ-12)	0.853	0.765	0.731	0.845

Correlation coefficient values of 0.1-0.3, 0.3-0.5 and <0.5 indicate weak, moderate and strong correlation, respectively.*** p≤0.001

Table 5- Spearman correlation coefficients between tinnitus primary function questionnarie **-12 scores and** beck's depression inventory **and** pittsburgh sleep quality index **scores in participants with tinnitus (n=56)**

TPFQ-12 questionnaire	**PSQI total score**		**BDI-II total score**	
	P	r	P	**r**
Concentration	0.010	0.343	<0.001	**0.602**
Emotions	0.003	0.389	<0.001	**0.660**
hearing	0.154	0.193	0.008	**0.353**
sleep	<0.001	0.502	0.007	**0.356**
Total score	0.001	0.416	<0.001	**0.600**

TPFQ;Tinnitus Primary Function Questionnarie, PSQI; Pittsburgh Sleep Quality Index , BDI-II; Beck's Depression Inventory.Correlation coefficient values of 0.1-0.3, 0.3-0.5 and <0.5 indicate weak, moderate, and strong correlation, respectively.

(A) (B)

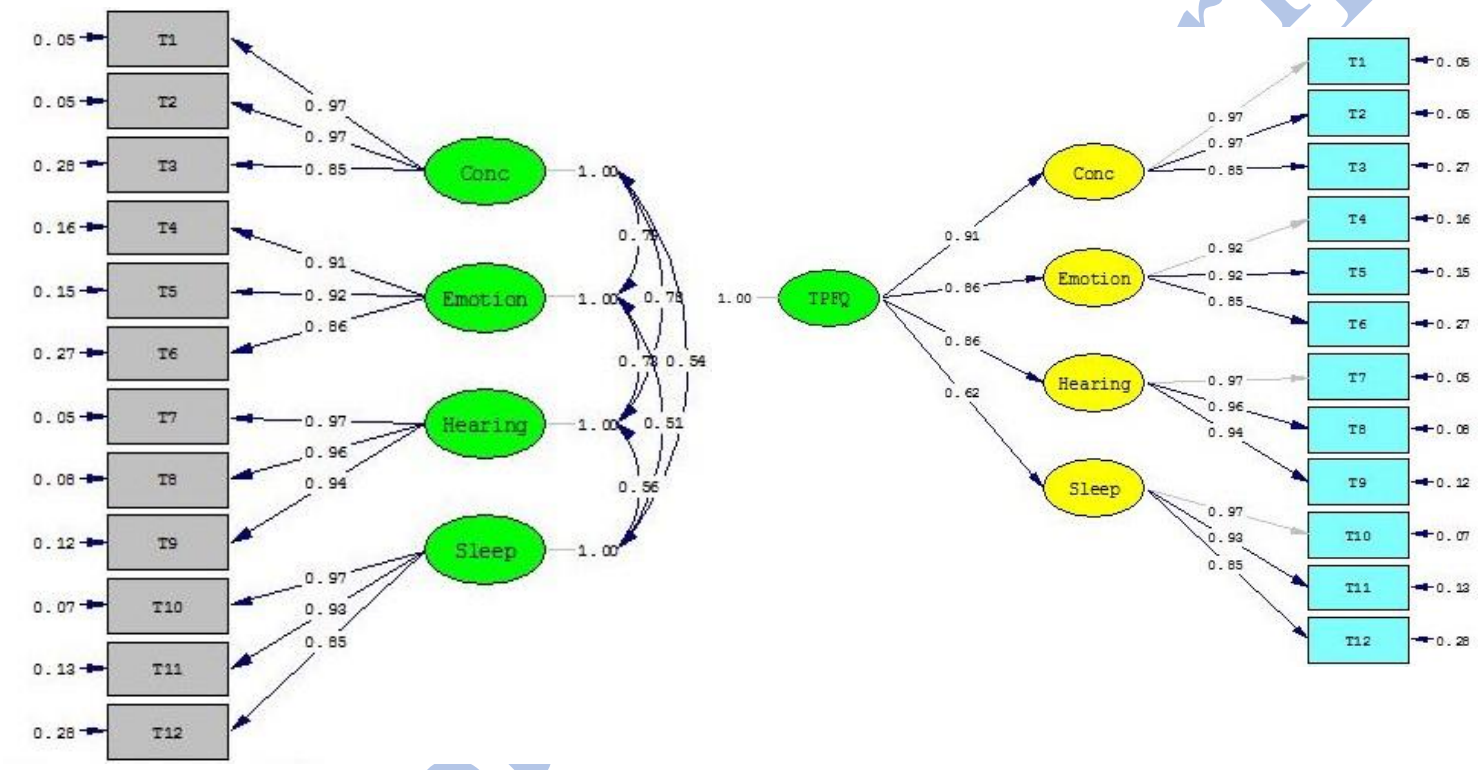
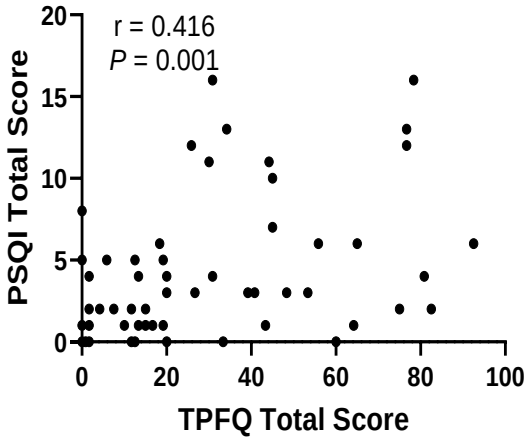


Figure1 : Confirmatory factor analysis of first-order (A) and second-order (B) four-factor model of the tinnitus primary function questionnarie**-12 questionnaire**



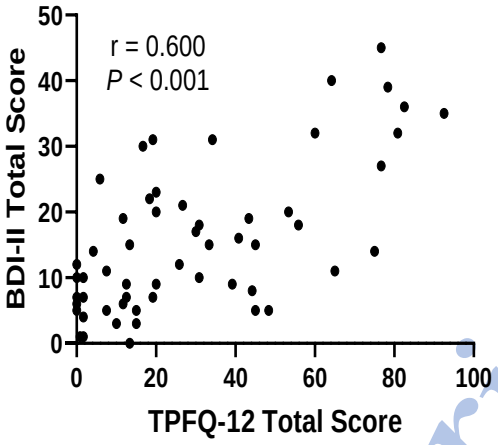


Figure2. The relationship between tinnitus primary function questionnarie **-12 total score and** Beck's depression inventory **and** pittsburgh sleep quality index **total scores in people with tinnitus(r: Spearman's correlation coefficient). Correlation coefficient values of 0.1-0.3, 0.3-0.5 and <0.5 indicate weak, moderate and strong correlation, respectively.**