

# Trans-adaptation and Standardization of Arabic Version of Tinnitus Primary Function Questionnaire

Original  
Article

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## ABSTRACT

**Background :** Tinnitus affects the life quality. Various questionnaires used for assessing its severity and its impact on quality of life. Among those is the Tinnitus Primary Function Questionnaire (TPFQ).

**Aim:** Arabic translation of (TPFQ). Decide its validity and reliability among Egyptians with tinnitus.

**Patients and Methods:** Agreement was obtained from the creator of the original TPFQ-12. The English version was converted into Arabic by a forward translation, back-translation, expert committee review, pretesting and finishing translation process according to the published guidelines for cross-civilizing adaptation of health-related quality of life measures. It was applied on a control group (100 normal not complaining of tinnitus) and a study group (80 patients with chronic tinnitus). Validity and reliability of the questionnaire were established.

**Results:** The Arabic TPFQ-12 showed high internal consistency; Cronbach's alpha 0.819 for study group while 0.806 for the control group. Repeatability of the Arabic TPFQ-12 questionnaire was high for the study and control groups respectively. with a significant difference between the study and control groups results.

**Conclusion:** The Arabic TPFQ is a dependable tool for estimation of tinnitus effect on the quality of Egyptians life.

**Key Words:** Arabic, reliability, tinnitus, tinnitus primary function questionnaire, translation.

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## INTRODUCTION

Tinnitus is a perceived sound in one or both ears or within the head, in the absence of an external stimulus<sup>[1]</sup>. Chronic tinnitus concerns millions of population worldwide especially adults (5-10%) and is mostly customary in the older population. Tinnitus is a devastating experience disturbing the life quality, causing symptoms of irritability, dejection, anxiety, disappointment, sleeplessness, obscurity concentration and social gloom<sup>[2]</sup>. There is difficulty in assessing tinnitus severity, so this lead to development of various questionnaires used in research and in clinical settings for the measurement of the severity of tinnitus and its impact on the patient's quality of life. Among those questionnaires are Tinnitus Handicap Inventory (THI)<sup>[3]</sup> and Tinnitus Primary Function Questionnaire<sup>[4]</sup>.

Tinnitus Primary Function Questionnaire (TPFQ) is a novel questionnaire designed particularly to assess how tinnitus influences the primary behavior contacts a person's life. TPFQ consists of 12 items subdivided into 4 subscales: concentration, emotions, hearing and sleep subscales. Each item can be answered by single number from (0-100)<sup>[5]</sup>.

A lot of Tinnitus surveys have been transformed into numerous dissimilar languages. Thus, it is important to achieve a psychometric confirmation and compare the results of the questionnaire for each language. Cross-cultural variations model the consequence of tinnitus on the patient's quality of life at various national, geographic and cultural backgrounds<sup>[6]</sup>.

Our aim was to translate the TPFQ-12 into literary Arabic (or modern standard Arabic) according to the guidelines for cross-cultural adaptation of health-related quality-of-life measures to come up with a unified Arabic version that will help physicians in Arabic-speaking countries like Egypt to assess the impact of tinnitus on the life quality of patients with tinnitus.

## METHODOLOGY:

Ethical approval for the current study was taken from the ethical committee in Menoufia University under number 421/4/12/2017 on 10<sup>th</sup> December 2017. Subjects in

the current study were selected from audiology unit, ENT department, Menoufia University hospital. All subjects were native Arabic speakers with age range (18-45) years. An approval was attained from all included patients. The study took place from December 2017 to September 2018. Subjects consisted of: The control group; 100 normal persons (25 males, 75 females) who were not complaining of tinnitus and the study group; 80 tinnitus patients (22 male and 58 female), were not less than 3 months with or without hearing impairment. Meanwhile, patients with neurological, psychological & behavioral issues were excluded.

After obtaining the permission from the author of the original English version of the TPFQ-12 professor Richard Taylor, the translation and cross cultural adaptation of TPFQ-12 were performed in 6 steps based on guidelines published by the American Association of orthopedic Surgeons outcome committee<sup>[7]</sup>.

**The first step:** was forward translation into the Arabic language was performed independently by 2 bilingual native Arabic-speaking individuals, including one physician. The translators then met with the principal examiner and established over.

**The second step:** was meeting of both of the translators and the principle investigator to identify any discrepancies between the 2 translated versions, then they agree over one Arabic version.

**The third step:** was backward translation of the previously obtained Arabic version into English by 2 individuals who are native Arabic speakers with excellent English language and not aware of the original English version of TPFQ-12.

**The fourth step:** was an expert committee. It consists of 4 translators and the authors to compare the original TPFQ-12 to the 2 back-translation to produce the pre-final version of TPFQ-12.

**The fifth step:** was pre-testing the pre-final Arabic version of the Questionnaire on 10 patients to assess the clarity and the adaptability of the questionnaire items.

**The sixth step:** was the transcription of the proceeding steps and the interviews of the patients were analyzed to write the final version of TPFQ-12. The final version of TPFQ-12 was then administered to 100 normal individual and 80 patients with chronic persistent tinnitus who fulfilled the inclusion criteria after signing a written informed consent to be included in this study.

All subjects in our study were submitted to; full history, general, neurologic, otological, basic audio logical examination and Arabic form of Tinnitus Primary Function Questionnaire that consists of 12 items related to tinnitus, focusing on four areas (Concentration, Emotion, Hearing,

and Sleep). The scores were from (0-100). All subjects were asked to give scoring of single number where 0 meaning completely disagree and 100 meaning completely agree. In the current study, some subjects were unable to fill the questionnaire due to low educational level or illiteracy, so, more clarification & explanation of the questionnaire items was provided by the examiner. We then determined the validity of the Arabic translation by trying it on some Egyptians with tinnitus and presenting its reliability through statistical analysis.

#### **Statistical Analysis:**

Outcomes were obtained, tabularized and analyzed statistically using an IBM personal computer with SPSS (version 22, Inc, Chicago, Illinois, USA). Data were introduced as mean ( $\bar{X}$ ), standard deviation (SD) and range, in the form numbers and/or percentages. Internal consistency reliability by measuring Cronbach's alpha and test-retest reliability were intended for reliability analysis. Mann-Whitney test and Spearman correlation coefficient were used for validity. Also, receiver operating characteristic (ROC) curve, sensitivity, specificity, positive and negative predictive values were considered for possible cut off points.

#### **RESULTS**

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A total of 180 person [100 normal persons-not complaining of tinnitus (control group) and 80 patient with chronic tinnitus persistent for >3 months (the study group)] were conscripted in the study. Both groups show non-significant statistical difference between them as regarding the age and sex ( $P > 0.05$ ) using t-test and chi-square test respectively. The mean TPFQ-12 score and its standard deviation were intended for each item, as well as for each subscale and for the total TPFQ-12 (Table 1). In (Table 2), the highest scores were for sleep and emotion but among Americans the highest scores were for concentration and hearing subscales. (Table 1) shows that there were statistically significant differences between study and control groups regarding the means of subscales of the Arabic TPFQ-12 including (concentration, emotion, hearing and sleep) the mean of these subscales was higher in study group than control group ( $P$  value  $< 0.001$ ).

Cronbach's alpha coefficient was considered for each item and for the total TPFQ-12 to assess the reliability of the new Arabic version of the TPFQ-12. All items shared quite enough in the internal consistency of Arabic form of tinnitus primary function questionnaire with good reliability translated in Cronbach's alpha in (Figure 3). In (Figure1) there is positive correlation between items of the Arabic TPFQ-12 in the 1<sup>st</sup> and 2<sup>nd</sup> visit among study group indicating good repeatability ( $p$  value  $< 0.001$ ). In (Table 3) Tinnitus primary function questionnaire has sensitivity 97%, specificity 99% in diagnosis of the effect of tinnitus on the primary behavior of a person's life. The most sensitive cut off point is 75.5. The impact of tinnitus

on daily life is affected by the degree of hearing loss (Figure; 2). Sleeping was increased with reduction of the hearing level. It was higher in moderate, moderately severe

and severe hearing loss tinnitus patients. The emotional subscale was at highest levels in normal hearing and mild hearing loss tinnitus patients.

Table (1): Descriptive analysis of all items of Arabic TPFQ-12:

Items	Study group	Control group	Mann Whitney test	P value
	Mean $\pm$ SD	Mean $\pm$ SD		
Q1	25.6 $\pm$ 17.8	4.66 $\pm$ 3.75	9.03	<0.001*
Q2	23.7 $\pm$ 17.5	4.32 $\pm$ 3.43	8.80	<0.001*
Q3	27.6 $\pm$ 19.7	2.97 $\pm$ 2.85	9.37	<0.001*
Q4	37.2 $\pm$ 21.9	3.32 $\pm$ 2.88	10.9	<0.001*
Q5	16.5 $\pm$ 12.6	3.35 $\pm$ 3.11	7.87	<0.001*
Q6	33.3 $\pm$ 18.8	0.00 $\pm$ 0.00	10.9	<0.001*
Q7	30.8 $\pm$ 16.5	0.00 $\pm$ 0.00	11.9	<0.001*
Q8	22.3 $\pm$ 16.8	0.00 $\pm$ 0.00	11.2	<0.001*
Q9	18.7 $\pm$ 14.0	0.00 $\pm$ 0.00	11.7	<0.001*
Q10	37.8 $\pm$ 25.2	0.00 $\pm$ 0.00	11.7	<0.001*
Q11	36.5 $\pm$ 24.8	0.00 $\pm$ 0.00	11.4	<0.001*
Q12	39.1 $\pm$ 29.0	0.00 $\pm$ 0.00	11.7	<0.001*
Total score	349.2 $\pm$ 139.4	18.6 $\pm$ 15.7	11.5	<0.001*

Table (2): Comparison between study and control groups regarding the mean of subscales of the Arabic TPFQ-12:

Subscales	Study group	Control group	Mann Whitney test	P value
	Mean $\pm$ SD	Mean $\pm$ SD		
Concentration	76.9 $\pm$ 47.7	13.3 $\pm$ 10.2	9.55	<0.001*
Emotion	86.8 $\pm$ 43.7	9.64 $\pm$ 8.46	10.9	<0.001*
Hearing	71.9 $\pm$ 32.3	0.00 $\pm$ 0.00	12.6	<0.001*
Sleep	113.4 $\pm$ 72.9	0.00 $\pm$ 0.00	11.8	<0.001*

Number=80 study, 100 controls SD: Standard deviation \* significant

Table (3): Sensitivity and specificity of the Arabic TPF-12 in tinnitus diagnosis:

AUC	Cutoff point	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)
0.99	75.5	0.97	0.99	0.99	0.98	0.98

AUC = Area under the curve

PPV =Positive predictive value

NPV = negative predictive value.

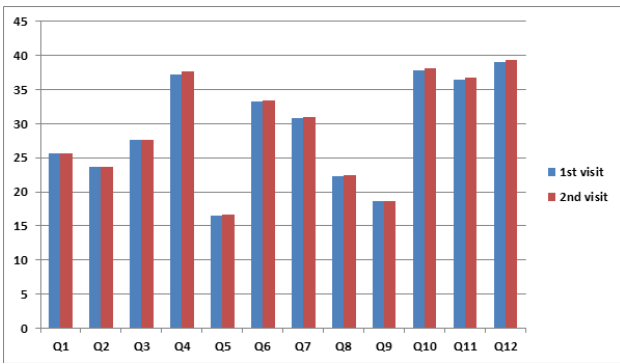


Fig. 1: Test-retest reliability of the Arabic TPFQ-12 among the study group:

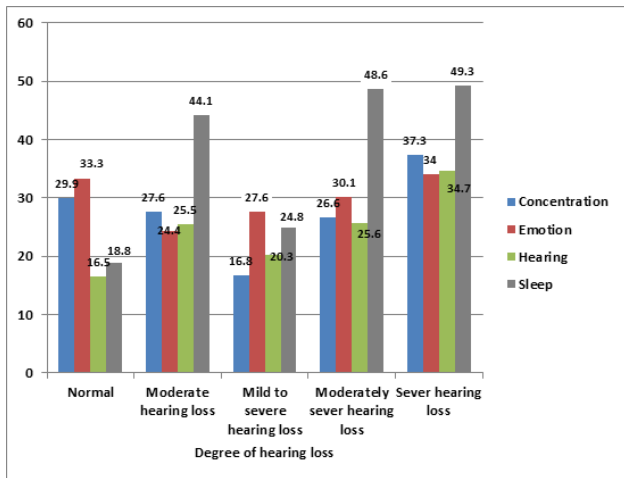


Fig. 2: Relation between degree of hearing loss and subscales of the Arabic form of Tinnitus Primary Function Questionnaire:

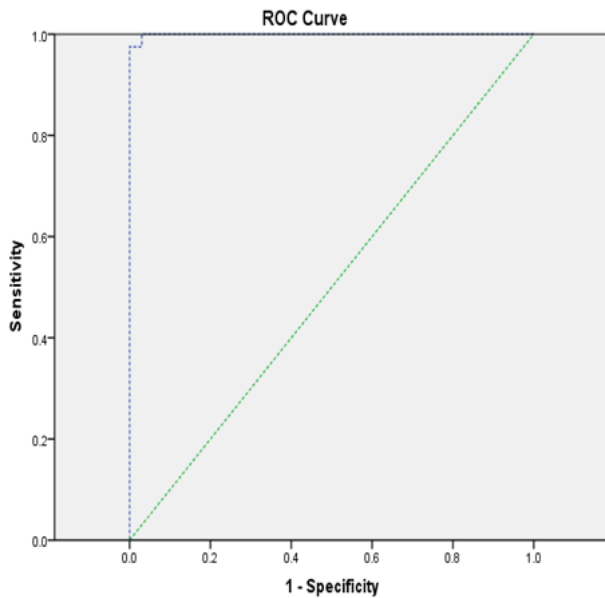


Fig 3: Roc curve for Arabic tinnitus primary function questionnaire

## DISCUSSION

This Tinnitus Primary Function Questionnaire is a new questionnaire (TPFQ) that was designed specifically to evaluate the primary effects of tinnitus on person’s life. It focuses on the four areas; emotions, hearing, sleep and concentration. These areas influence basic life functions as socialization and relaxation<sup>[8]</sup>. So Tinnitus Primary Function Questionnaire in this study was converted into Arabic to enrich the battery of tinnitus management and improve the outcome of its management in Arabic countries like Egypt.

Subjects in control and study groups in this study were matched in age and gender. On correlation between the age of patients and the Arabic TPFQ-12 scores, no significant statistical correlation was found, and this is in agreement with the Hindi version<sup>[9]</sup>. The reliability of the Arabic TPFQ-12 was examined by internal consistency and test-retest reliability. All items shared quite enough in the internal consistency of Arabic form of tinnitus primary function questionnaire with good reliability translated in Cronbach’s alpha with 0.819 among patients and 0.806 among controls as in (Figure 3).

The test-retest correlation was done on 100 control group and 80 study group after two days of the first administration they were asked to fill the questionnaire again. Repeatability of the questionnaire was high for both of the total Arabic TPFQ-12 score and each item scores. So these results suggested that the Arabic TPFQ-12 had acceptable stability over time and good reliability ( $P Value < 0.001$ ) as in (Figure 1). Hearing loss affects the life of tinnitus patients in a way that differs with the degree of hearing loss.

## CONCLUSION

Our Arabic version of the TPFQ-12 is a valid and reliable tool for the assessment of the impact of tinnitus on the quality of life of Arabic-speaking patients with chronic tinnitus. Future studies are recommended with further studies on using the Arabic version of TPFQ-12 regarding different types of tinnitus, include more elaborate validation analysis (eg. factor analysis and convergent validity) to compare the TPFQ-12 to other quality-of-life measures. The authors recommend the use of the Arabic TPFQ-12 in clinical settings, assessing tinnitus severity and follow up of tinnitus management among the Egyptian and Arabic population.

## CONFLICT OF INTEREST

There are no conflicts of interest.

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