

## Jordanian Arabic Adaptation of the Tinnitus Handicap Inventory

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### Abstract

Tinnitus might be defined as a perception of noise in ear or head without the presence of external sound. It might be caused by a disorder in the auditory system and the brain. The degree of invasiveness of the tinnitus and its effects on patients' quality of life is very difficult to measure. The Tinnitus Handicap Inventory of English language (THI-E) is considered as the easy standardized method to quantify the degree of disability caused by tinnitus. This study was conducted to establish and validate a THI in Jordanian Arabic language like the THI-E. The THI-E questioners were translated into formal Jordanian Arabic language by four bilingual volunteers. Then final version was applied on forty-two patients at the tinnitus soft laser therapy clinic. The results illustrate an excellent internal reliability. There is a significant correlation between Beck Depression Inventory, the State Anxiety Inventory and the developed Jordanian Arabic Tinnitus Inventory of this study.

### Keywords

Arabic Jordanian Inventory, Ear laser therapy, Tinnitus, Tinnitus Assessments, Tinnitus Handicap Inventory, Tinnitus Inventory.

### 1. Introduction

Tinnitus may be defined as hearing of whistling or noise in the ear or head with absent of outside sound source which might be due to a disorder in the auditory system or the brain. It may cause major disturbance to people quality of life and is rare caused by of a serious disease such as acoustic tumor.

Tinnitus is a very common complaint among adult and children which is classified as subjective and objective. The objective tinnitus is defined as hearing of sound or noise in the ear without the presence of external sound source which may be heard by others ( Henry et al., 2003; El-Beaino and Eter, 2017). On the other hand, the subjective tinnitus is merely heard by the patient himself. Some individuals report a high correlation

between the intensity of tinnitus, and the movements of shoulder, head and neck, or jawing. Majority of tinnitus patients' have tinnitus and hearing loss at the same frequencies.

The prevalence of tinnitus increases with presence of hearing loss, aging, receiving of ototoxic drugs and noise exposure. The tinnitus severity may range from mild to catastrophic, which can be disabling and limiting one's daily activities (Henry et al., 2007; El-Beaino & Eter, 2017). English language Tinnitus Handicap Inventory (THI-E) is well known and widely accepted as the a valid and standardized test for measuring the degree of tinnitus and its invasiveness effects on the patients quality of life which was subsequently got translated to many languages (Zachariae 2000; Aksoy, 2007; Monzani, 2008). However, for Jordanian Arabic language, there is no validated and standardized

questionnaires to assess tinnitus severity. This study was conducted to develop standardized THI questionnaires in the Jordanian Arabic language utilizing the standardized THI-E as the reference source.

### 2. Materials and methods

The author utilized the translated THI-E to Jordanian Arabic language by four bilingualist volunteers to develop the final Arabic THI version (THI-A). The questionnaires answers were: No (0 point), Sometime (2 points), Yes (4 points). The questionnaire’s reliability was assessed using the Cronbach’s alpha test, and the same test was used to assess specific subscales of the THI-A which were classified in three groups as functional, emotional, and catastrophic.

The study was conducted at the soft laser therapy clinic at the Middle East Hearing and Balance Centre. All subjects were 42 bilingual (Arabic and English) patients (22 male and 20 female), aged range 18 to 66 years (average age was 43.3 years), who were suffering from tinnitus for more than 3 months. The average duration of tinnitus was 10.3 years (arrange of 4 months to 36.2 years). The subjects filled the questionnaires twice, half of them started with the THI-A version then the THI-E (table 1), and the second half started with the THI-E then the THI-A.

The severity of tinnitus was evaluated on a scale of 0-10. using the Beek’s Depression Inventory (BDI) and the State Anxiety Inventory (SAI). The results were analyzed using ANOVA. Spearman and Pearson tests were utilized to measure the correlation between the THI-A scores, the THI-E scores, BDI score, SAI score, tinnitus severity, tinnitus duration, hearing loss, and gender.

### 3. Results and Discussion

It can be seen from Figure 1 that about 24% the participated subjects in this study had normal hearing thresholds, about 14% of the subjects had conductive hearing loss, and about 62% of the subjects had of sensorineural hearing loss.

The THI-A and THI-E results of the 42 patients are presented in the Table 1. It can be seen from the Table that the subjects’ responses for both THI-A is THI-E are similar and there is significant difference between them. The comparison between

overall percentages between THI-A and THI-E for all rows and column illustrates there is no significant difference between them ( $p > 0.05$ ). There is a very strong correlation between the total and subscales of THI-A and THI-E. The results also reveal that the hearing level, and type of hearing loss (the conductive and the sensorineural hearing loss) have no significant difference in the outcome of the total and subscales of both THI-E and the THI-A ( $P > 0.05$ ).

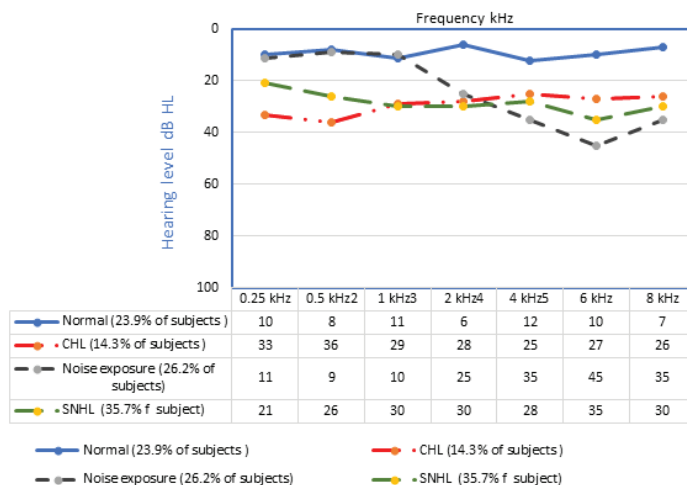


Figure 1: Types and degree of hearing loss of the participated patients

The results of Cronbach’s Alpha Coefficients of the THI of this study, the Danish, the Turkish, the Hebrew and the Italian versions are presented in figure 2. The correlation of each item of the THI-A (total and subtotal scores) and the Cronbach’s Alpha Coefficient, the severity of tinnitus and duration, BDI score, and SAI score are summarized in Table 1, and Figures 2 - 4.

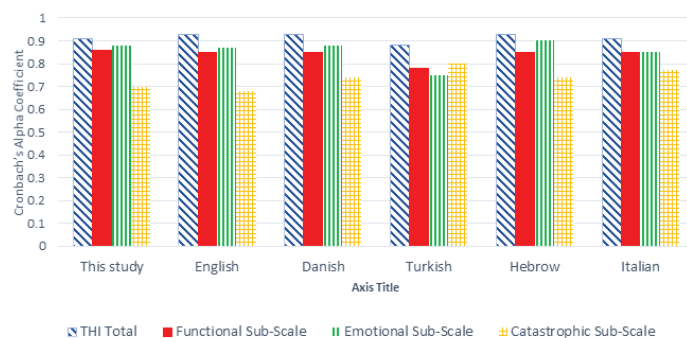


Figure 2: Comparison between the Cronbach’s Alpha Coefficient of this study and other studies for English, Danish, Turkish, Hebrew, and Italian languages.

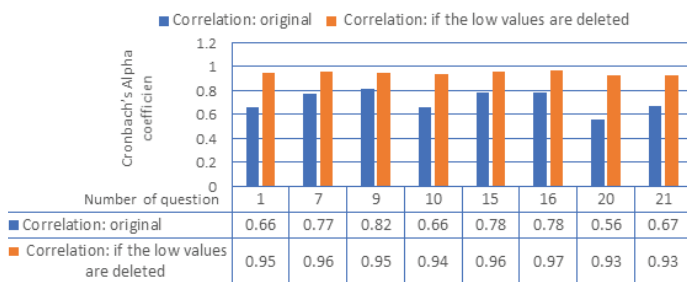
It is apparent from tables 1 and Figures 2-4 that the developed THI-A test version is appropriate to assess the tinnitus disability. It has excellent internal consistency of main group and sub-groups like the other versions of different languages. The outcomes of this study are comparable with the previous studies

results (El-Beaino & Eter, 2017). All show excellent correlation between the scores of total THI-A (scales and sub-scales) the BDI, and the SAI.

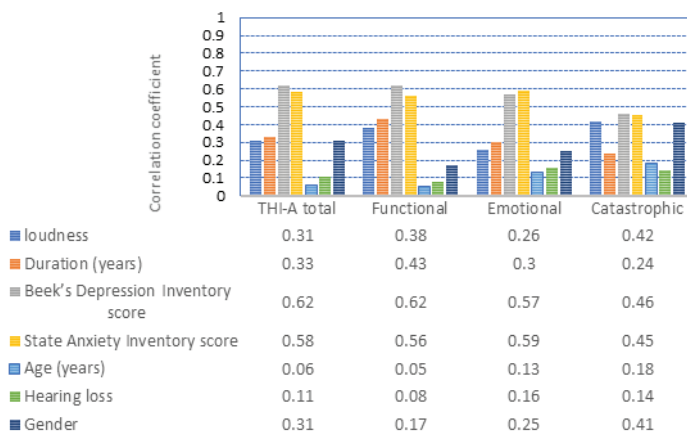
**Table 1:** Comparison between percentage of the participants responses of the THI-A and the THI-E.

| Question No | Class | Yes Arabic | Sometime Arabic | No Arabic | Total Arabic | Yes English | Sometime English | No English | Total English |
|-------------|-------|------------|-----------------|-----------|--------------|-------------|------------------|------------|---------------|
| 1           | F     | 14         | 32              | 38        | 84           | 22          | 28               | 32         | 82            |
| 2           | F     | 32         | 22              | 38        | 92           | 34          | 28               | 30         | 92            |
| 3           | E     | 22         | 30              | 42        | 94           | 20          | 38               | 42         | 100           |
| 4           | F     | 16         | 32              | 52        | 100          | 18          | 30               | 54         | 102           |
| 5           | C     | 26         | 26              | 46        | 98           | 24          | 26               | 48         | 98            |
| 6           | E     | 18         | 28              | 52        | 98           | 16          | 26               | 58         | 100           |
| 7           | F     | 24         | 20              | 56        | 100          | 24          | 38               | 38         | 100           |
| 8           | C     | 44         | 20              | 36        | 100          | 50          | 20               | 30         | 100           |
| 9           | F     | 30         | 38              | 32        | 100          | 22          | 40               | 34         | 96            |
| 10          | E     | 24         | 34              | 42        | 100          | 28          | 38               | 34         | 100           |
| 11          | C     | 34         | 30              | 36        | 100          | 24          | 24               | 44         | 92            |
| 12          | F     | 18         | 38              | 44        | 100          | 22          | 28               | 46         | 96            |
| 13          | F     | 22         | 40              | 34        | 96           | 10          | 32               | 44         | 86            |
| 14          | F     | 20         | 30              | 40        | 90           | 22          | 32               | 44         | 98            |
| 15          | F     | 20         | 28              | 46        | 94           | 20          | 30               | 48         | 98            |
| 16          | E     | 30         | 30              | 36        | 96           | 26          | 30               | 40         | 96            |
| 17          | E     | 24         | 24              | 40        | 88           | 26          | 28               | 38         | 92            |
| 18          | F     | 10         | 42              | 44        | 96           | 10          | 42               | 44         | 96            |
| 19          | C     | 32         | 14              | 40        | 86           | 40          | 18               | 38         | 96            |
| 20          | F     | 32         | 22              | 40        | 94           | 18          | 22               | 50         | 90            |
| 21          | E     | 26         | 28              | 46        | 100          | 18          | 30               | 44         | 92            |
| 22          | E     | 24         | 26              | 46        | 96           | 24          | 26               | 48         | 98            |
| 23          | C     | 20         | 40              | 48        | 108          | 10          | 40               | 50         | 100           |
| 24          | F     | 22         | 22              | 46        | 90           | 26          | 24               | 50         | 100           |
| 25          | E     | 24         | 32              | 44        | 100          | 26          | 38               | 40         | 104           |
|             |       | 608        | 728             | 1064      | 2400         | 580         | 756              | 1068       | 2404          |

**Key sub-scale:** F= Functional, E=Emotional, C =Catastrophic Key sub-scale: F= Functional, E=Emotional, C =Catastrophic



**Figure 3:** Item total correlation, and the Cronbach’s Alpha coefficient if the low values are deleted



**Figure 4:** The correlation between the scores of THI-A, BDI, SAI, tinnitus loudness, tinnitus duration, patients age, hearing loss and gender.

**4. Conclusions**

Evidently, it can be concluded from these results that the developed THI-A test, of this study, is a reliable test to assess tinnitus intrusiveness of native Jordanian Arabic speakers’ population. The clinicians and researchers may use this test as standardized test to assess the intensity of tinnitus and its effects on the patients’ quality of life

**Conflict of interests**

The author declares that there is no conflict of interest

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**References**

Aksoy, S., First, Y., & Alpar, R. (2007). The Tinnitus Handicap Inventory: a study of validity and reliability. *Int Tinnitus J*;13(2): 94-98

El-Beaino, M., and Eter, E. (2017). Arabic validation of the tinnitus handicap inventory and the mini-tinnitus questionnaire on 100 adult patients. *Clinical Otolaryngology*.

10-40.

Henry JA, James KE, Owens K, Zaugg T, Porsov E, Silaski G. (2003). Auditory test result characteristics of subjects with and without tinnitus, *J Rehabil Res Dev*.2009;46(5):619-32.2. Heller AJ. Classification and epidemiology of tinnitus, *Otolaryngol Clin North Am*;36(2):239-48

Monzani, D., Genvese, E., Marrara, A., Gherpelli, C., Pingani, L., forghieri, M. Rigatelli, M., Guadagnin, T., & Arslan, E., (2008). Validity of the Italian adaptation of the Tinnitus Handicap Inventory; focus on quality of life and psychological distress in tinnitus-sufferers. *Acta Otorhinolaryngology Ital* ;28(3):126-134

Zachariae, R., Mirz, F, Johansen, L., Andersen, S., Bjerring, P., & Pedersen, C., (2000). Reliability and validity of a Danish adaptation of the Tinnitus Handicap Inventory. *Scand Audiol*; 29 (1): 37-43

**Index 1: Jordanian Arabic Tinnitus Handicap Inventory (THI-A)**

This test will help us to identify the degree of tinnitus and its effects of your quality of life. Please print the questionnaires and draw a circle around your answer next to each question.

| No. | السؤال   | 4 نقاط | 0 نقطة | 2 نقطة    |
|-----|--|--------|--------|-----------|
| 1   | نتيجة لطنين الاذن، هل تجد صعوبة في التركيز   | نعم    | لا     | بعض الوقت |
| 2   | هل ارتفاع شدة الطنين يجعل سماع الآخرين صعبا  | نعم    | لا     | بعض الوقت |
| 3   | هل طنين الاذن يجعلك عصبي المزاج  | نعم    | لا     | بعض الوقت |
| 4   | هل طنين الاذن يجعلك مشوشا  | نعم    | لا     | بعض الوقت |
| 5   | نتيجة لطنين الاذن، هل تعاني من اليأس   | نعم    | لا     | بعض الوقت |
| 6   | هل أنت كثير التذمر من سماع الطنين  | نعم    | لا     | بعض الوقت |
| 7   | نتيجة لطنين الاذن، هل تجد صعوبة في النوم (الغفيان)                                     | نعم    | لا     | بعض الوقت |
| 8   | هل تشعر بأن الطنين ملازم لك ولا تستطيع التخلص منه                                      | نعم    | لا     | بعض الوقت |
| 9   | هل الطنين يقف عائق أمام الاستمتاع بالحياه الاجتماعية مثل الذهاب الى المطاعم أو السينما | نعم    | لا     | بعض الوقت |
| 10  | نتيجة لطنين الاذن، هل تعاني من خيبات الأمل   | نعم    | لا     | بعض الوقت |
| 11  | نتيجة لطنين الاذن، هل تشعر انك تعاني من مرض خطير                                       | نعم    | لا     | بعض الوقت |
| 12  | هل طنين الاذن يجعلك تجد صعوبة في الاستمتاع بالحياة                                     | نعم    | لا     | بعض الوقت |
| 13  | هل طنين الاذن يعيق أداؤك لعملك أو مسؤولياتك المنزلية                                   | نعم    | لا     | بعض الوقت |
| 14  | نتيجة لطنين الاذن هل تعاني غالبا من سرعة الانفعال                                      | نعم    | لا     | بعض الوقت |
| 15  | نتيجة لطنين الاذن هل تجد صعوبة بالقراءة والمطالعة                                      | نعم    | لا     | بعض الوقت |
| 16  | هل يجعلك الطنين غير سعيد أو غير مبسوط  | نعم    | لا     | بعض الوقت |
| 17  | هل تشعر بأن الطنين يسبب توتر بعلاقتك مع أفراد الاسرة أو الأصدقاء                       | نعم    | لا     | بعض الوقت |
| 18  | هل تجد صعوبة بتحويل تركيزك عن الطنين إلى أي شيء آخر                                    | نعم    | لا     | بعض الوقت |
| 19  | هل تشعر بأنك لا تستطيع السيطرة على الطنين  | نعم    | لا     | بعض الوقت |
| 20  | نتيجة للطنين هل تشعر غالبا بالتعب  | نعم    | لا     | بعض الوقت |
| 21  | نتيجة للطنين هل تشعر بالاكتئاب   | نعم    | لا     | بعض الوقت |
| 22  | هل الطنين يجعلك قلقا   | نعم    | لا     | بعض الوقت |
| 23  | هل تسعر بأنك لا تستطيع تحمل الطنين وأن صبرك قد نفذ                                     | نعم    | لا     | بعض الوقت |
| 24  | هل الطنين يزيد ويصبح أسوأ عندما تكون تحت ضغط   | نعم    | لا     | بعض الوقت |
| 25  | هل يجعلك الطنين تشعر بعدم الأمان   | نعم    | لا     | بعض الوقت |
|     | مجموع العلامات لكل عامود   | نعم    | لا     | بعض الوقت |
|     | مجموع العلامات   |        |        |           |

**Keys:** Tinnitus Grading Severity. Calculate the total of your points then match it with degree level below

| Total points | Degree of tinnitus | Grades |
|--------------|--------------------|--------|
| 0 - 6        | Slight             | 1      |
| 18 - 36      | Mild               | 2      |
| 38 - 56      | Moderate           | 3      |
| 58 - 76      | Severe             | 4      |
| 78 - 100     | Catastrophic       | 5      |