

# Development of the Tinnitus Handicap Inventory

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**Objective:** To develop a self-report tinnitus handicap measure that is brief, easy to administer and interpret, broad in scope, and psychometrically robust.

**Design:** A standardization study of a self-report tinnitus handicap measure was conducted to determine its internal consistency reliability and convergent and construct validity.

**Setting:** Audiology clinics in tertiary care centers in two sites.

**Participants:** In the first investigation, 84 patients reporting tinnitus as their primary complaint or secondary to hearing loss completed the 45-item alpha version of the Tinnitus Handicap Inventory (THI). In the second investigation, 66 subjects also reporting tinnitus completed the 25-item beta version.

**Outcome Measures:** Convergent validity was assessed using another measure of perceived tinnitus handicap (Tinnitus Handicap Questionnaire). Construct va-

lidity was assessed using the Beck Depression Inventory, Modified Somatic Perception Questionnaire, symptom rating scales (annoyance, sleep disruption, depression, and concentration), and perceived tinnitus pitch and loudness judgments.

**Results:** From the alpha version of the THI, we derived a 25-item beta version with the items grouped into functional, emotional, and catastrophic subscales. The total scale yielded excellent internal consistency reliability (Cronbach's  $\alpha=.93$ ). No significant age or gender effects were seen. Weak correlations were observed between the THI and the Beck Depression Inventory, Modified Somatic Perception Questionnaire, and pitch and loudness judgments. Significant correlations were found between the THI and the symptom rating scales.

**Conclusion:** The THI is a self-report measure that can be used in a busy clinical practice to quantify the impact of tinnitus on daily living.

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**T**HERE HAS been an increasing interest among health care providers in quantifying the handicapping consequences of a disease state.

That is, clinicians are interested not only in the direct effects of a particular condition (eg, pain severity) but also the impact this condition or symptom has on the patient's general well-being. In addition, emphasis has been placed on outcome measures that may be used to evaluate the effects of medical and nonmedical treatment of otologic, pulmonary, cardiac, rheumatologic, gastrointestinal, and neurologic disorders.<sup>1-4</sup> Measurement tools have ranged from general quality-of-life scales<sup>5</sup> to disorder-specific scales.

Disorder-specific self-report measures are emerging as useful clinical tools in audiology and otology for two reasons. First, they help substantiate pa-

tients' auditory and balance complaints not readily apparent by audiometric and vestibulometric testing. Second, self-perceived handicap scales serve as functional outcome measures when used in a pretreatment and posttreatment paradigm, with reduction in self-perceived handicap as the desired positive outcome. In this connection, self-report measures have been used to document benefit derived following the provision of hearing aids,<sup>6</sup> counseling-based aural rehabilitation,<sup>7</sup> and balance retraining and vestibular rehabilitation.<sup>8</sup>

In addition to hearing and balance measures, self-report tinnitus handicap

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## MATERIALS AND METHODS

### INVESTIGATION 1—ITEM DEVELOPMENT

The alpha-THI consisted of 45 items derived empirically from case histories of patients with tinnitus. In addition, some of the items were adapted from existing hearing<sup>3</sup> and dizziness<sup>4</sup> scales and symptom categories described by Tyler and Baker.<sup>17</sup> The 45 items constituting the alpha-THI were chosen to ensure content and face validity.

Eighty-four patients participated (47 men and 37 women). The subject sample was drawn from Henry Ford Hospital (Detroit, Mich) (85%) and the Veterans Affairs Medical Center (West Haven, Conn) (15%). The mean ( $\pm$ SD) age of the sample was  $54.3 \pm 14.3$  years, ranging from 23 to 77 years. All subjects reported tinnitus at the time of the audiologic examination; the tinnitus was either their primary complaint or secondary to hearing loss.

An inspection was made of the percentage of subjects responding yes, sometimes, or no to individual questions. Items with high endorsement rates for one of the response options were considered insensitive and were eliminated. That is, it was believed that items with endorsement rates for one of the response options discriminated little between subjects. For example, 85% of the subjects responded no to the question, "Because of your tinnitus are you afraid to leave home without having someone with you?" **Table 1** summarizes the endorsement rates for each item selected for the beta-THI. As can be seen, endorsement rates for a yes response ranged from 8% to 63%; for a sometimes response, 11% to 49%; and for a no response, 19% to 64%.

Internal consistency reliability of the alpha-THI was calculated using Cronbach's alpha. Items having high item-total correlations are considered more representative of the scale's content than items demonstrating low item-total cor-

relations. Cronbach's alpha coefficient for the alpha-THI was .97 with item total correlations ranging from  $r=.25$  ("Does your tinnitus get worse when you are in a quiet place?") to  $r=.85$  ("Because of your tinnitus do you feel depressed?"). Item-total correlations selected for the beta-THI ranged from  $r=.57$  to  $r=.85$ . We empirically rejected any items from the alpha-THI with item-total correlations of .50 or less. Using this criterion alone, four items were deleted from the alpha-THI.

Based on a combination of response frequency distribution, item-total correlations, and content validity, the 25-item beta-THI was developed. Scoring of the beta-THI was identical to its companion self-report hearing<sup>3,18</sup> and dizziness<sup>4</sup> scales. That is, a yes response is awarded four points; sometimes, two points; and no, zero points. Accordingly, scores for the total scale range from zero to 100 points, with higher scores representing greater perceived handicap.

Three subscales were developed following examination of the content of each item constituting the beta-THI (Table 1). The functional subscale (11 items) reflected role limitations in the areas of mental functioning (eg, item 1, "Because of your tinnitus is it difficult for you to concentrate?"), social/occupational functioning (eg, item 9, "Because of your tinnitus do you not enjoy social activities such as going out to dinner, to the movies?"), and physical functioning (eg, item 7, "Because of your tinnitus do you have trouble falling to sleep at night?"). The emotional subscale (nine items) included items representing a broad range of affective responses to tinnitus (eg, item 3, anger; item 10, frustration; item 14, irritability; item 21, depression). A final subset of items were believed to probe the catastrophic response to the symptoms of tinnitus. The catastrophic subscale (five items) reflects patients' desperation (item 5), inability to escape from tinnitus (item 8), perception of having a terrible disease (item 11), lack of control (item 19), and inability to cope (item 23).

methods are gaining recognition as tools for quantifying the impact of tinnitus on everyday life. Although a number of tinnitus scales are available,<sup>9</sup> many of them lack reliability and validity data, measure a limited number of constructs, use rating methods scales that are confusing to certain patients, or are difficult to score and interpret. For example, no internal consistency reliability data were reported for the Tinnitus Handicap/Support Questionnaire,<sup>10</sup> Tinnitus Effect Questionnaire,<sup>11</sup> and the Tinnitus Severity Questionnaire.<sup>12</sup> Although the Tinnitus Handicap Questionnaire<sup>13</sup> is broad in scope and focuses on the social, emotional, and behavioral effects of tinnitus (factor 1), tinnitus and hearing (factor 2), and the patient's outlook on tinnitus (factor 3), the psychometric adequacy of factor 3 as an independent measure is questionable. That is, factor 3 yielded low internal consistency reliability<sup>13</sup> and low test-retest reliability.<sup>14</sup> Furthermore, the response method (choosing a number between zero and 100 that corresponds with subjective strength of belief) is unwieldy or esoteric to some patients.<sup>15</sup> Most recently, the Tinnitus Reaction Questionnaire<sup>16</sup> was developed, having good internal consistency reliability and test-retest reliability. The major weakness associated with this latter scale is that it focuses solely on the psychological construct of distress.

In light of the limitations associated with the aforementioned measures, the present investigation was undertaken to develop a self-report Tinnitus Handicap Inventory (THI) with the following characteristics: (1) it should be brief so that it can be used in a busy clinical practice; (2) it should be easy to administer and interpret; (3) it should be broad in scope, reflecting the impact of tinnitus on everyday function; and (4) it should be psychometrically robust, demonstrating adequate reliability and validity. There were two phases in the development of the THI: (1) item development; and (2) administration to a clinical sample to determine internal consistency reliability and convergent and construct validity.

## RESULTS

**Table 2** displays the mean, SD, and range values for the THI. The large SDs associated with the THI show that reactions to tinnitus varied among individuals. In addition, the observed wide range of scores demonstrated that the sample was heterogeneous with respect to self-perceived tinnitus handicap. The standard error of measurement ( $S_e$ ) was calculated as described by Demorest

## INVESTIGATION 2—RELIABILITY AND VALIDITY

Sixty-six subjects (37 men and 29 women) participated in the second phase. The subject sample was drawn from Henry Ford Hospital (83%) and the Veterans Affairs Medical Center (17%). The mean ( $\pm$ SD) age of the sample was  $54.2 \pm 13.1$  years, ranging from 27 to 80 years. All subjects reported having tinnitus during their evaluation. The mean ( $\pm$ SD) length of time subjects reported having tinnitus was  $6.7 \pm 10.02$  years, whereas the average time patients were bothered by the tinnitus was  $4.5 \pm 9.78$  years. Almost half of the subjects (47%) described their tinnitus as a "ringing" sensation. Speech frequency pure tone averages (SFPTA; 500, 1000, and 2000 Hz) and high-frequency pure tone averages (HFPTA; 1000, 2000, and 4000 Hz) were calculated for the right (mean SFPTA=19.7 dB hearing level [HL]; mean HFPTA=25.7 dB HL) and left (mean SFPTA=21.0 dB HL; mean HFPTA=28.2 dB HL) ears. Comparisons of the SFPTA and HFPTA indicated that most subjects had sloping high-frequency hearing losses. In addition to analyzing the internal consistency reliability of the beta-THI, convergent and construct validity were evaluated using the following measures.

### SELF-PERCEIVED TINNITUS HANDICAP

The Tinnitus Handicap Questionnaire<sup>13</sup> is a 27-item self-assessment inventory composed of three factors. Factor 1 (15 items) assesses the physical health, emotional status, and social consequences of tinnitus. Factor 2 (eight items) evaluates hearing difficulty related to tinnitus, and factor 3 (four items) addresses the patient's viewpoint of tinnitus. For convergent validity of the THI, it was anticipated that high correlations should exist between self-report scales that are broad in scope, such as the Tinnitus Handicap Questionnaire.

and Walden<sup>21</sup> ( $S_e = S_x \sqrt{1 - r_{xx}}$ ), where  $S_x$  is the SD of the total score (20.5) and  $r_{xx}$  is the internal consistency reliability coefficient (.93). The  $S_e$  associated with the total THI was 5.4 points. Accordingly, the 95% confidence interval for the patient's true THI score ( $\pm 2S_e$ ) would be  $\pm 10.8$  points. That is, it would be unlikely that a patient's score on the THI would deviate by more than 10.8 points from his or her true score.

### EFFECTS OF AGE, GENDER, AND HEARING LOSS

Pearson product-moment correlations were calculated between age and THI scores to determine whether there was an association between subject age and perceived tinnitus handicap. Results failed to demonstrate a statistically significant relationship between age and the total THI ( $r = -.06$ ,  $P = .64$ ), functional ( $r = -.01$ ,  $P = .91$ ), emotional ( $r = -.13$ ,  $P = .30$ ), and catastrophic ( $r = .01$ ,  $P = .96$ ) subscales. Gender differences in perceived tinnitus handicap were examined using independent Student's *t* tests. No significant gender differences were observed ( $P > .05$  for total and subscales). Independent Student's *t* tests were also performed to determine whether differences existed in perceived tinnitus handicap between subjects with

## DEPRESSION

The Beck Depression Inventory (Beck)<sup>19</sup> is a 21-item scale designed to evaluate specific behavioral manifestations of depression and provides a quantitative assessment of the intensity of depression. The inventory consists of a graded series of four to five self-evaluative statements.

### SOMATIC AWARENESS

The Modified Somatic Perception Questionnaire<sup>20</sup> is a 13-item scale designed to measure somatic and autonomic perception. The scale was originally standardized on a sample of 102 patients with chronic back pain; however, the developer of the scale suggested that it may be appropriate for use with other chronic problems. The response to each of the 13 somatic items is assessed by a zero- to three-point scale.

### PERCEIVED TINNITUS LOUDNESS AND PITCH

Each subject made a subjective judgment of the overall loudness and pitch of his or her tinnitus using a 10-point scale. For loudness scaling, the anchors were 1, indicating very faint tinnitus and 10, representing very loud tinnitus. For pitch scaling, a 1 response represented a very low-pitched foghorn, and 10 represented a very high-pitched whistle.

### SYMPTOM RATING SCALES

Subjects responded to four individual rating scales using a 100-point scale.<sup>9</sup> Subjects were instructed to write a single number between zero and 100 for each scale. Subjective judgments were made regarding the following: (1) annoyance; (2) sleep disruption; (3) depression; and (4) concentration disturbance.

normal hearing ( $n=25$ ) and hearing loss ( $n=38$ ). In the present study, normal hearing for each subject was defined as having the SFPTA and HFPTA in both ears of 20 dB or less HL. No significant hearing loss effects were observed ( $P > .05$  for total and subscales).

### INTERNAL CONSISTENCY RELIABILITY

Cronbach's alpha reliability estimates were calculated to determine the internal consistency reliability of the final version of the THI. A Cronbach's alpha of .93 was obtained for the 25-item THI, indicating excellent internal consistency reliability. As shown in Table 1, the item-total correlations ranged from .22 to .77. Item 2 ("Does the loudness of your tinnitus make it difficult for you to hear people?") with an item-total correlation of .22 was retained because of its high content validity. That is, difficulty understanding speech is a major complaint among individuals with tinnitus.<sup>15</sup>

The internal consistency reliability for each subscale was analyzed separately. Cronbach's alpha was .86 for items constituting the functional subscale (item-total correlations ranging from .27 to .76), .87 for the emotional subscale (item-total correlations ranging from .56 to .82), and .68 for the catastrophic subscale (item-

**Table 1. Items Comprising the Beta (Final) Version of the Tinnitus Handicap Inventory With Associated Endorsement Rates and Item-Total Correlations\***

Item	Endorsement Rates, %			Item-Total Correlation
	Yes	Sometimes	No	
The purpose of the scale is to identify the problems your tinnitus may be causing you. Check "Yes," "Sometimes," or "No" for each question. Do not skip a question.				
1F. Because of your tinnitus is it difficult for you to concentrate?	24	49	27	.70
2F. Does the loudness of your tinnitus make it difficult for you to hear people?	35	35	30	.22
3E. Does your tinnitus make you angry?	20	38	42	.54
4F. Does your tinnitus make you feel confused?	18	25	57	.64
5C. Because of your tinnitus do you feel desperate?	17	25	58	.54
6E. Do you complain a great deal about your tinnitus?	17	26	57	.63
7F. Because of your tinnitus do you have trouble falling to sleep at night?	24	38	38	.48
8C. Do you feel as though you cannot escape your tinnitus?	60	20	20	.55
9F. Does your tinnitus interfere with your ability to enjoy social activities (such as going out to dinner, to the movies)?	8	29	63	.61
10E. Because of your tinnitus do you feel frustrated?	29	37	34	.77
11C. Because of your tinnitus do you feel that you have a terrible disease?	14	23	63	.48
12F. Does your tinnitus make it difficult for you to enjoy life?	12	26	62	.69
13F. Does your tinnitus interfere with your job or household responsibilities?	10	32	58	.56
14F. Because of your tinnitus do you find that you are often irritable?	22	32	46	.69
15F. Because of your tinnitus is it difficult for you to read?	20	29	51	.48
16E. Does your tinnitus make you upset?	25	38	37	.76
17E. Do you feel that your tinnitus problem has placed stress on your relationship with members of your family and friends?	26	20	54	.53
18F. Do you find it difficult to focus your attention away from your tinnitus and on other things?	15	42	43	.69
19C. Do you feel that you have no control over your tinnitus?	63	18	19	.48
20F. Because of your tinnitus do you often feel tired?	18	23	59	.58
21E. Because of your tinnitus do you feel depressed?	18	26	56	.63
22E. Does your tinnitus make you feel anxious?	25	26	49	.54
23C. Do you feel that you can no longer cope with your tinnitus?	11	40	49	.59
24F. Does your tinnitus get worse when you are under stress?	43	25	32	.49
25E. Does your tinnitus make you feel insecure?	16	20	64	.47

\*F represents an item contained on the functional subscale; E, an item contained on the emotional subscale; and C, an item contained on the catastrophic response subscale.

**Table 2. Tinnitus Handicap Inventory (Total, Functional, Emotional, and Catastrophic Response Subscales) (N=66)**

	Tinnitus Handicap Inventory			
	Total*	Functional†	Emotional‡	Catastrophic§
Mean±SD	25.4±20.5	11.0±9.7	8.2±8.4	6.1±4.5
Range	0-92	0-44	0-32	0-18

\*Maximum score=100.  
 †Maximum score=44.  
 ‡Maximum score=36.  
 §Maximum score=20.

total correlations ranging from .42 to .48). Items with the highest correlations within each subscale are most representative of the total subscale score. Accordingly, item 1 ("Because of your tinnitus is it difficult for you to concentrate?") is most representative of the functional subscale, item 10 ("Because of your tinnitus do you feel frustrated?") is most representative of the emotional subscale, and item 19 ("Do you feel that you have no control over your tinnitus?") is most representative of the catastrophic response subscale.

**Table 3** summarizes the Pearson product-moment correlations among the total THI and subscale scores. The results yielded moderate to strong correlations ( $P<.001$ ), ranging from  $r=.65$  to  $r=.93$ .

### CONVERGENT VALIDITY

The expected relations for convergent validity were observed. The correlation coefficient between the total THI and the total Tinnitus Handicap Questionnaire scores was  $r=.78$  ( $P<.001$ ), suggesting that overall both scales measure comparable dimensions of self-perceived tinnitus handicap.

### CONSTRUCT VALIDITY

**Table 4** presents the responses to the Beck, Modified Somatic Perception Questionnaire, tinnitus pitch and loudness ratings, and symptom ratings (four subscales). A noteworthy constriction in Beck scores is consistent with mild or chronic depressive states, in contrast to acute or significant depression. **Table 5** summarizes the correlations among scores on the THI and the other assessment measures. Low statistically significant ( $P<.05$ ) correlation coefficients ( $r=.24$  to  $r=.38$ ) were observed among

scores on the total THI, functional and emotional subscales, and the Beck and Modified Somatic Perception Questionnaire, with the highest correlation ( $r=.38$ ) found between the Beck and the emotional subscale. As shown, weak correlations were observed among the Beck, Modified Somatic Perception Questionnaire, and the catastrophic subscale. In contrast, moderate to high correlations ( $r=.47$  to  $r=.72$ ) were found between the THI (total and subscales) and the symptom rating scales of annoyance, sleep, depression, and concentra-

tion. Low correlations were observed between the THI (total and subscales) and the subjectively rated pitch judgments ( $r=.06$  to  $r=.18$ ) and loudness judgments ( $r=.20$  to  $r=.24$ ).

### COMMENT

During the past few years, there has been a growing interest among health care providers to assess patients' functional status using self-report measures.<sup>22</sup> We have developed a 25-item self-report tinnitus handicap scale that is the companion to the Hearing Handicap Inventory for the Elderly/Adults<sup>3,18</sup> and the Dizziness Handicap Inventory.<sup>4</sup> The THI probes the functional, emotional, and catastrophic response reactions to tinnitus and does not appear to be affected by age, gender, or hearing loss (ie, normal hearing sensitivity vs hearing loss). In a busy clinical practice environment, a self-report measure must be brief, have a simple response format, and be easy to score and interpret. The THI meets each of these practical considerations. Furthermore, although some well-established scales evaluate physical, emotional, and social consequences of tinnitus, the THI response categories reflect a novel alternative analysis of reactions.

The results of the present investigation demonstrated that the THI has good internal consistency reliability for the total scale ( $\alpha=.93$ ) and is adequate for the functional ( $\alpha=.86$ ) and emotional ( $\alpha=.87$ ) subscales. As anticipated, the alpha coefficient was lower for the catastrophic subscale ( $\alpha=.68$ ) because of the smaller number of items constituting this dimension. We decided, however, to retain the latter subscale because of its potential use for identifying the most handicapped individuals requiring more aggressive treatment. That is, affirmative responses to specific items on the catastrophic subscale represent the most severe reactions to the tinnitus sensation (eg, desperation, intrusiveness, loss of control, fear of grave disease), alerting the clinician that the patient may require referral to other professionals (eg, psychiatry or psychology). In addition, the items constituting the catastrophic subscale may represent those areas most amenable to treatment and may produce the most dramatic effects if changes are observed.

Unexpected in light of recent reports by Kuk et al<sup>13</sup> and Wilson et al<sup>16</sup> was the weak relationship between the

**Table 3. Pearson Product-Moment Correlations Among Tinnitus Handicap Inventory (Total, Functional, Emotional, and Catastrophic Response Subscales) (N=66)**

	Total	Functional	Emotional	Catastrophic
Total	1.00			
Functional	.92	1.00		
Emotional	.93	.75	1.00	
Catastrophic	.89	.65	.78	1.00

**Table 4. Responses to Questionnaires Regarding Psychological Status (Beck Depression Inventory [Beck]; Modified Somatic Perception Questionnaire [MSPQ]), Symptom Rating Scales, and Tinnitus Ratings (Pitch and Loudness)**

Scale	Sample Size	Mean±SD	Range of Scores
Beck*	66	5.9±5.7	0-24
MSPQ†	66	4.9±5.0	0-20
Symptom ratings‡			
Annoyance	42	52.0±34.3	1-100
Sleep	39	31.6±37.3	0-100
Depression	39	24.0±28.2	0-100
Concentration	38	26.2±29.0	0-100
Tinnitus ratings§			
Pitch	57	6.4±2.7	1-10
Loudness	62	6.1±2.6	1-10

\*Maximum score=63.

†Maximum score=39.

‡Maximum score=100.

§Maximum score=10.

**Table 5. Pearson Product-Moment Correlations Among Scores on the Tinnitus Handicap Inventory Beck Depression Inventory (Beck), Modified Somatic Perception Questionnaire (MSPQ), Symptom Rating Scales, and Subjective Tinnitus Ratings**

	Beck (n=66)	MSPQ (n=66)	Symptom Rating Scales				Tinnitus Ratings	
			Annoyance (n=42)	Sleep (n=39)	Depression (n=39)	Concentration (n=38)	Pitch (n=57)	Loudness (n=62)
Total	.32 $P=.01$	.29 $P=.02$	.67 $P<.001$	.70 $P<.001$	.72 $P<.001$	.71 $P<.001$	.10 $P=.46$	.24 $P=.60$
Functional	.28 $P=.04$	.31 $P=.01$	.66 $P<.001$	.72 $P<.001$	.66 $P<.001$	.76 $P<.001$	.06 $P=.69$	.22 $P=.08$
Emotional	.38 $P=.002$	.27 $P=.03$	.60 $P<.001$	.67 $P=.001$	.67 $P<.001$	.59 $P<.001$	.10 $P=.48$	.23 $P=.07$
Catastrophic	.22 $P=.08$	.13 $P=.30$	.50 $P=.001$	.56 $P<.001$	.62 $P<.001$	.47 $P=.03$	.18 $P=.19$	.20 $P=.12$

THI and depression measured by the Beck. This may be explained, in part, by the fact that the THI was standardized on a sample of patients reporting tinnitus during their audiologic evaluation and that it was not necessarily their primary complaint. In fact, a higher correlation between the Beck and THI might have been observed had a sample composed of more significantly depressed individuals been examined. We believe, however, that the sample is most representative of patients seen by audiologists and otologists in a medical facility and, therefore, an appropriate sample to standardize the THI. An alternative explanation is that some of the sample were chronic tinnitus sufferers, for which the chronic depression may be less detectable by the Beck.

The theoretical construct of somatic attention and its relationship to self-perceived tinnitus handicap was also explored. This dimension was examined because a number of investigators have suggested that attentional mechanism may be an underlying cognitive variable relating to tinnitus annoyance,<sup>23</sup> and thus increased tinnitus handicap. In this connection, Hallam et al<sup>23</sup> hypothesized that tinnitus noises become troublesome because they receive attention by the patient focusing on the tinnitus itself. The concept of somatic attention relates to an individual's awareness of bodily sensations and that decreases in the intensity of external stimuli often result in internal information becoming more salient to the individual. This principle may explain why a patient reports a "worsening" of his or her tinnitus at night when the surroundings are quiet.

In the present study, a weak association was observed between the THI and somatic awareness as quantified by the Modified Somatic Perception Questionnaire. This finding is in keeping with the observations of Cioffi,<sup>24</sup> who has reported that increased attention to somatic information does not necessarily increase distress (and thus perceived increased handicap). In fact, she contends that increased attention to somatic sensations may actually reduce psychological distress and promote adaptive functional outcomes.

Construct validity also was assessed in a subgroup of patients (n=44) who responded to the THI and the 100-point symptom rating scales. Substantial correlations were found between the self-rating measures of annoyance, sleep disruption, depression, and concentration and the THI. These observations suggest that the THI has adequate construct validity for those handicapping reactions to tinnitus known to affect patients with tinnitus.<sup>17</sup> The aforementioned symptoms accounted for 45% to 52% of the variance in the total scale score.

In conclusion, we have developed a self-report tinnitus handicap measure that is brief, easily administered, and assesses the domains of function remedied by a variety of medical and rehabilitative approaches. The THI would be helpful in selecting those patients with tinnitus most in need of intervention.

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