

# Tinnitus Self-Efficacy and Other Tinnitus Self-Report Variables in Patients With and Without Post-Traumatic Stress Disorder

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**Objective:** Individuals with tinnitus and co-occurring psychological conditions typically rate their tinnitus as more disturbing than individuals without such comorbidities. Little is known about how tinnitus self-efficacy, or the confidence that individuals have in their abilities to successfully manage the effects of tinnitus, is influenced by mental or psychological health (PH) status. The purpose of this study was to examine the influence of psychological state on tinnitus perceptions and tinnitus self-efficacy in individuals with chronic tinnitus.

**Design:** Observational study. Three groups (N = 199) were examined and included: (1) those with tinnitus without a concurrent psychological condition (tinnitus-only; n = 103), (2) those with tinnitus and concurrent PH condition other than post-traumatic stress disorder (PTSD; tinnitus + PH; n = 34), and (3) those with tinnitus and PTSD (tinnitus + PTSD; n = 62). The Self-Efficacy for Tinnitus Management Questionnaire (SETMQ) was administered. Responses on the SETMQ were compared among the groups, as well as to other indicators of tinnitus perception such as (1) the percentage of time tinnitus was audible (tinnitus awareness), (2) the percentage of time tinnitus was distressing/bothersome, (3) tinnitus loudness, (4) tinnitus handicap inventory scores, (5) subjective ratings of degree of hearing loss, and (6) subjective ratings of sound tolerance problems.

**Results:** The tinnitus + PTSD group reported significantly poorer tinnitus self-efficacy levels on average than the tinnitus-only group on all SETMQ subscales and poorer self-efficacy levels than the tinnitus + PH group for most subscales (except for routine management and devices). Tinnitus self-efficacy levels were similar between the tinnitus + PH and tinnitus-only groups except for the emotional response subscale in which the tinnitus-only patients reported higher self-efficacy on average than both the other groups. Group differences were not seen for tinnitus loudness ratings nor for the amount of time individuals were aware of their tinnitus. Group differences were observed for the percentage of time tinnitus was distressing/bothersome, self-reported degree of hearing loss, sound tolerance problems ratings, and responses on the tinnitus handicap inventory (THI). In general, the group differences revealed patient ratings for the tinnitus-only group were least severe, followed by the tinnitus + PH group, and the tinnitus + PTSD group rated tinnitus effects as most severe. With all patient responses, the tinnitus + PTSD group was found to be significantly more affected by tinnitus than the tinnitus-only group; in some cases, the responses were similar between the tinnitus + PTSD and tinnitus + PH group and in other cases, responses were similar between the tinnitus + PH group and the tinnitus-only group.

**Conclusions:** Tinnitus self-efficacy, along with other self-assessed tinnitus characteristics, varied across groups distinguished by PH diagnoses. In general, individuals with tinnitus and concurrent PTSD reported significantly poorer tinnitus self-efficacy and more handicapping tinnitus effects when compared to individuals with other psychological condi-

tions or those with tinnitus alone. The group differences highlighted the need to consider tinnitus self-efficacy in intervention strategies, particularly for patients with tinnitus and concurrent PTSD as the results reiterated the unique ability of PTSD to interact in powerful and disturbing ways with the tinnitus experience and with patients' coping ability.

**Key words:** Cognitive-behavioral therapy, Post-traumatic stress disorder, Self-efficacy, Tinnitus.

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## INTRODUCTION

The negative psychosocial effects of bothersome tinnitus in individuals are well established (Fowler 1948; Sullivan et al. 1988; Greimel & Kröner-Herwig 2011). Compared with individuals with no tinnitus perception, those who report tinnitus are more likely to experience concurrent depression, anxiety, and sleep disorder, as well as reduced quality of life (Tyler & Baker 1983; McKenna 2004; Zöger et al. 2006). Additional reports indicate individuals with tinnitus and a psychological condition rate their psychological state as poorer than those affected individuals without tinnitus (Holgers et al. 2005; Hinton et al. 2006). These reports suggest that tinnitus and mental health status may interact with each other in a way that exacerbates their unique effects. Thus, regardless of a specific causal relation, there exists a bidirectional influence between the response to tinnitus and the individual's mental health state (Harrop-Griffiths et al. 1987; Dobie 2003). The mutual reinforcement of effects observed between tinnitus and a psychological condition is particularly evident, and even more obvious, in individuals with a psychological injury such as post-traumatic stress disorder (Hinton et al. 2006; Fagelson 2007).

McKenna et al. (2014) offered a cognitive-behavioral model of tinnitus distress in which the authors asserted that in at least half the cases in which tinnitus coexists with psychological disorders, negative thoughts patients have about their tinnitus may reinforce their already-negative emotional state. Individuals with depression and anxiety describe thoughts related to tinnitus by using terms such as persecution, despair, hopelessness, and loss of enjoyment. The model offered by McKenna et al. appeals to the use of cognitive training or cognitive-behavioral therapy (CBT; Henry & Wilson 1998; Cima et al. 2012) as a way to improve the ability of a patient to restructure, or reconsider his/her evaluation of the tinnitus experience. The more negative the patients' evaluation of their tinnitus, the less likely that they will be able to habituate to the tinnitus signal. Indeed, Zöger et al. (2006) reported that tinnitus severity and scores on the Hospital Anxiety-Depression Scale (Zigmond & Snaith 1983) were correlated, particularly with regard to the depression subscale scores. In most instances, tinnitus distress increased

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with the severity of a psychological disorder. As Greimel and Kröner-Herwig (2011) asserted, “Tinnitus is always a medical and psychological phenomenon” (p. 223).

Post-traumatic stress disorder (PTSD) is a unique psychological condition and was first identified by name in the American Psychological Association Diagnostic and Statistical Manual-III (1986). Before that time, PTSD was not distinguished from other psychological sequelae of traumatic exposures, and most often was labeled as a form of chronic stress response (Herman 1997). PTSD is a psychological injury associated with chronic hyperarousal, as well as nightmares and intrusive memories (i.e., flashbacks) that persist for at least 1 month following the trauma. The diagnostic criteria for PTSD as designated by the American Psychological Association (American Psychiatric Association 2013) includes the following symptoms: (1) exposure to traumatic stressor, (2) re-experiencing symptoms (e.g., flashbacks), (3) employing avoidance behaviors, (4) cognitive distortions and mood changes related to trauma and its reminders, (5) symptoms of increased arousal, (6) duration greater than 1 month, and (7) significant distress or impairment of functioning. For many patients, these symptoms never completely subside; they produce profound changes in the ability to function, thereby corrupting relationships, employment, and most substantially, the character of an individual. Patients suffering from PTSD endure, at times and more frequently than patients without PTSD, psychological conditions such as depression, anxiety, and rage (Shay 1994; Herman 1997). Their ability to function in social situations also may be influenced by sensory disturbances such as light sensitivity, sound sensitivity, and tinnitus (Hinton et al. 2006; Fagelson 2007) as well as hallucinations (Bremner 2002) and aversions to crowds of people.

Some of the most blatant problems experienced by patients with PTSD are associated with powerful physical reactions to environmental stimuli that trigger memories of past events (Shay 1994; Schnurr & Jankowski 1999; Bremner 2002; Diamond et al. 2007). Specifically, many patients report that certain sounds trigger intrusive and horrifying memories, physical discomfort or pain, survival responses such as “diving for cover,” and may exacerbate PTSD symptoms such as heightened startle responses, anxiety, and sensations of stress. Tinnitus similarly provokes a variety of disturbing sensations in patients with PTSD. Their mutual influence may impair the ability of a patient to navigate routine activities due to exaggerated responses to innocuous environmental events. Schnurr and Jankowski (1999) explained this component of PTSD as the misinterpretation of sensory events; such sensory mislabeling may exacerbate other PTSD symptoms (such as hyperarousal, or feelings of threat), and may influence the level of confidence patients need to conduct their lives in a manner consistent with their pretrauma ability. In addition to misinterpretation of the environment, the exposure to moderately loud or unexpected sounds is three times as likely to exacerbate tinnitus (i.e., the individual experiences reactive tinnitus) in patients with PTSD relative to a patient with tinnitus who does not suffer from PTSD (Fagelson 2007).

The combination of sound tolerance issues and tinnitus exacerbation may conspire to create powerful aversions to a variety of social situations. Patients consistently reiterate their need to establish and maintain a sense of control over the environment and its effect on their routine activities to function comfortably. Similarly, because it is a symptom that defies control, tinnitus may provide a persistent amplifier for the disturbance

experienced by the patient with PTSD or other psychological disorders in a variety of environmental conditions. If individuals' ability to function and adapt to challenges relates to a sense of control and security in an environment, then a psychological injury that promotes sensory mislabeling as it compels hyperactive monitoring of the environment can have isolating and debilitating effects. Facilitating the sense of control in patients in challenging environments, perhaps through incorporation of CBT or self-efficacy enhancing techniques should therefore be a rehabilitative priority for tinnitus patients, especially those with concurrent mental health illness or injury, such as PTSD.

Self-efficacy refers to the confidence individuals have in their capabilities to accomplish a *specific* goal or behavior (Bandura 1986). An individual's confidence levels typically vary when considered in the context of achieving different goals or behaviors, therefore, self-efficacy should be considered in relation to a specific context or domain rather than being considered an overriding patient characteristic. Domain-specific self-efficacy suggests, therefore, that an individual can have high self-efficacy beliefs regarding one behavior (e.g., driving) while simultaneously displaying low self-efficacy beliefs regarding another behavior (e.g., public speaking). The present study focuses on *tinnitus self-efficacy*, which was defined previously as the confidence individuals have in their ability to perform courses of action needed to manage their tinnitus successfully (Smith & Fagelson 2011). Before interventions can be developed to promote tinnitus self-efficacy, however, we first must understand the role that tinnitus self-efficacy plays among other domains of tinnitus.

Smith and Fagelson (2011) reported the relations among several domains of tinnitus perceptions in patients suffering from chronic tinnitus. Tinnitus self-efficacy, or the certainty patients have in their ability to control various aspects of tinnitus in daily life, were among the variables explored. Levels of tinnitus self-efficacy were measured via the Self-Efficacy for Tinnitus Management Questionnaire (SETMQ). The results showed that overall tinnitus self-efficacy was significantly correlated with percentage of time aware of tinnitus ( $r = -0.36$ ), percentage of awake time experiencing tinnitus annoyance/distress ( $r = -0.49$ ), tinnitus loudness ( $r = -0.39$ ), degree of hyperacusis ( $r = -0.35$ ), self-reported hearing loss ( $r = -0.37$ ), and tinnitus handicap as measured via the Tinnitus Handicap Inventory (THI; Newman et al. 1996;  $r = -0.49$ ). In general, these correlations suggested that the more debilitating the tinnitus, the less confident individuals were in managing their tinnitus. The influence of psychological status on these results was not considered in that study.

Because tinnitus perceptions and self-efficacy beliefs may be influenced by psychological health (PH), and PTSD in particular, we sought to examine the relation among psychological state, tinnitus self-efficacy, and other tinnitus characteristics in individuals with (1) tinnitus alone, (2) tinnitus and a concurrent PH condition, and (3) tinnitus and a concurrent diagnosis of PTSD. We anticipated that tinnitus patients with PTSD would report greater interference caused by tinnitus than those patients with a PH condition other than PTSD or in patients with tinnitus only. We speculated that this same pattern would extend to tinnitus self-efficacy in that we would find that patients who experienced tinnitus in the presence of concurrent psychological disorders, and PTSD in particular, would express poorer levels of confidence in managing the condition relative to those patients with tinnitus only.

## MATERIALS AND METHODS

### Participants

The participants were patients enrolled in the Tinnitus Clinic at the Veterans Affairs (VA) Medical Center, Mountain Home, Tennessee and whose SETMQ data were reported in a previous study (Smith & Fagelson 2011). For the present study, the participants ( $n = 199$ , with 193 being male Veterans) were categorized into three groups based on their PH status as determined by a secondary chart review and included the following: (1) tinnitus only—no diagnosis of a PH condition ( $n = 103$ ; tinnitus-only group), (2) tinnitus with a PH condition other than PTSD ( $n = 34$ ; tinnitus + PH group), and (3) tinnitus and PTSD ( $n = 62$ ; tinnitus + PTSD group). The diagnoses of the participants in the tinnitus + PH group primarily consisted of anxiety and/or depression. In particular, approximately 70% ( $n = 24$ ) of the PH conditions in the tinnitus + PH group included anxiety ( $n = 5$ ), depression ( $n = 13$ ), or both anxiety and depression ( $n = 6$ ). The remaining 30% of the participants in the tinnitus + PH group had other diagnoses such as bipolar disorder ( $n = 2$ ); bipolar disorder and anxiety ( $n = 1$ ); bipolar disorder and depression ( $n = 1$ ); bipolar disorder and panic disorder ( $n = 1$ ); panic disorder and depression ( $n = 1$ ); mood disorder and depression ( $n = 2$ ); panic disorder, depression, and anxiety ( $n = 1$ ); and depression, anxiety and acute stress ( $n = 1$ ). In the tinnitus + PTSD group, 6 participants (out of 62) had a PH diagnosis in addition to PTSD. These conditions were anxiety ( $n = 1$ ), bipolar disorder ( $n = 1$ ), depression ( $n = 2$ ), and a combination of these conditions ( $n = 2$ ), which were not considered in assigning individuals to this group. The mean age of the participants was 63.3 years ( $SD = 9.5$ ) with no significant group difference in age [ $F(2, 196) = 1.67, p = 0.191$ ]. Audiometric thresholds were obtained using the Hughson-Westlake procedure during clinical examinations and were not different among the groups [ $F(10, 915) = 1.25, p = 0.255$ ]. Figure 1 displays the average audiogram of the right ear of the participants ( $n = 186$ ).

### Procedures

A chart review of the local VA medical records was conducted to determine the PH status of the participants to categorize them in the three aforementioned groups. PH diagnoses would have been documented in the participant's medical record by a licensed mental healthcare provider during clinical visits using criteria established by those providers. Group comparisons of responses on the following single-item, self-report questions used to describe their tinnitus: (1) tinnitus awareness (0 to 100% of the patient's waking hours), (2) loudness rating (0 = very soft and 10 = very loud), (3) tinnitus distress (0 to 100% of the patient's waking hours), (4) hearing loss rating (0 = no hearing loss and 10 = severe hearing loss), and (5) hyperacusis rating (0 = no problem at all and 10 = as great of a problem as you can imagine). See Smith and Fagelson (2011) for a more detailed description of each single-item, self-report question. In addition, responses from two questionnaires, the SETMQ and THI, were available in the database.

The SETMQ is a 40-item questionnaire that assesses tinnitus self-efficacy levels with the following five subscales: (1) routine tinnitus management, (2) emotional response to tinnitus, (3) internal thoughts and interactions with others, (4) tinnitus concepts, and (5) use of assistive devices. The respondent rates their level of certainty, on a 0 to 100%, 10-unit interval

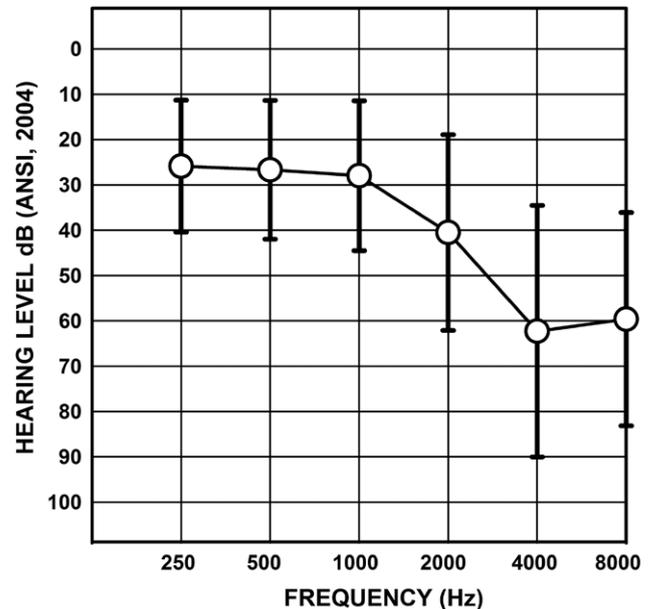


Fig. 1. The mean right-ear audiogram (and one standard deviation) of the participants with available audiograms from the chart review ( $n = 186$ ). Given no significant differences between right and left ear audiograms among the participant groups were found, the mean right ear audiogram arbitrarily was chosen for illustration.

scale, for managing a particular skill associated with tinnitus management. Mean subscale scores are calculated along with a total scale score. Higher scores represent higher levels of self-efficacy. Smith and Fagelson (2011) reported that the aggregate SETMQ displayed high test-retest reliability (intraclass correlation coefficient of 0.96) and internal consistency reliability (Chronbach's  $\alpha = 0.98$ ).

The THI (Newman et al. 1998) is a 25-item questionnaire that assesses tinnitus handicap. The respondent answers the THI questions with a "yes" (4 points), "sometimes" (2 points), or "no" (0 points) response. The responses are summed and range from 0 to 100. Higher scores are indicative of greater tinnitus handicap. Newman et al. reported the THI as having high test-retest reliability ( $r = 0.92$ ) and internal consistency reliability (Chronbach's  $\alpha = 0.93$ ).

## RESULTS

### Perception of Tinnitus

Table 1 lists the mean responses to the single-item, self-report questions and the THI. A separate one-way ANOVA was completed for each measure in Table 1 (tinnitus awareness, loudness rating tinnitus distress, tinnitus distress, self-reported degree of hearing loss, hyperacusis rating, and THI total score) to evaluate group differences. Bonferroni corrections for multiple comparisons were applied to posthoc analyses if a significant group effect was found.

The ANOVAs conducted to examine group differences in responses to the tinnitus awareness [ $F(2, 171) = 0.68, p = 0.506$ ] and the loudness rating [ $F(2, 183) = 2.45, p = 0.089$ ] items were not significant. These results suggested that regardless of the PH category in which the participants were grouped, estimates of tinnitus loudness and the amount of time that individuals were aware of their tinnitus were similar across participants.

**TABLE 1.** Mean scores and standard deviations are listed for the tinnitus measures for each participant group

| Tinnitus Measure             | Group         |               |                 |
|------------------------------|---------------|---------------|-----------------|
|                              | Tinnitus-Only | Tinnitus + PH | Tinnitus + PTSD |
| Tinnitus awareness (0–100%)  |               |               |                 |
| Mean (SD)                    | 69.9 (32.8)   | 72.7 (29.5)   | 76.1 (26.9)     |
| n                            | 89            | 29            | 54              |
| Loudness rating (0–10)       |               |               |                 |
| Mean (SD)                    | 6.5 (1.9)     | 6.6 (2.0)     | 7.2 (1.6)       |
| n                            | 95            | 32            | 57              |
| Tinnitus distress (0–100%)*  |               |               |                 |
| Mean (SD)                    | 39.6 (29.6)   | 43.5 (26.9)   | 53.2 (27.2)     |
| n                            | 71            | 27            | 49              |
| Hearing loss rating (0–10)*  |               |               |                 |
| Mean (SD)                    | 4.7 (2.5)     | 5.1 (2.6)     | 6.6 (2.5)       |
| n                            | 98            | 32            | 60              |
| Hyperacusis rating (0–10)*   |               |               |                 |
| Mean (SD)                    | 3.9 (3.2)     | 4.2 (3.3)     | 6.7 (2.6)       |
| n                            | 97            | 32            | 60              |
| Tinnitus handicap inventory* |               |               |                 |
| Mean (SD)                    | 39.6 (23.6)   | 45.7 (21.9)   | 61.9 (19.3)     |
| n                            | 69            | 24            | 40              |

The number of participants in each group who had available data for each variable also is listed.

\*Statistically significant difference among the groups

PH, psychological health; PTSD, post-traumatic stress disorder.

The responses to the tinnitus distress item were examined and a significant group difference was found [ $F(2, 146) = 3.41, p = 0.036$ ]. The ANOVA showed that the tinnitus + PTSD group rated a higher percentage the amount of time their tinnitus was distressing (i.e., bothersome) when compared with the tinnitus-only group. The tinnitus + PH group displayed similar ratings as the other two groups. This finding suggests that although participants with PTSD observed tinnitus as often as other participants, they rated their tinnitus as consistently more bothersome than patients without co-occurring PH conditions.

For the remaining variables in Table 1, the ANOVAs revealed that the tinnitus + PTSD group was significantly different from the other two groups whose ratings were similar to one another. These results considered degree of self-reported hearing loss [ $F(2, 189) = 9.8, p < 0.001$ ], hyperacusis severity [ $F(2, 188) = 16.4, p < 0.001$ ], and the THI total score [ $F(2, 132) = 13.0, p < 0.001$ ]. Thus, the tinnitus + PTSD group rated their hearing loss, sound tolerance problems, and tinnitus handicap as significantly worse when compared with the other two groups. Interestingly, the pure-tone thresholds among all three groups were similar. We viewed this discrepancy as further evidence of the disrupted sensory processing, or sensory mislabeling, that was most pronounced for the patients with PTSD. Likewise, and as noted previously (Fagelson 2007), those in the tinnitus + PTSD group also were more likely than members of other groups to report sound tolerance problems and tinnitus handicap as more severe than those problems as reported by individuals with tinnitus and without PTSD.

### Tinnitus Self-Efficacy

Figure 2 displays the mean self-efficacy levels as a function of SETMQ subscale and total scale score for each participant

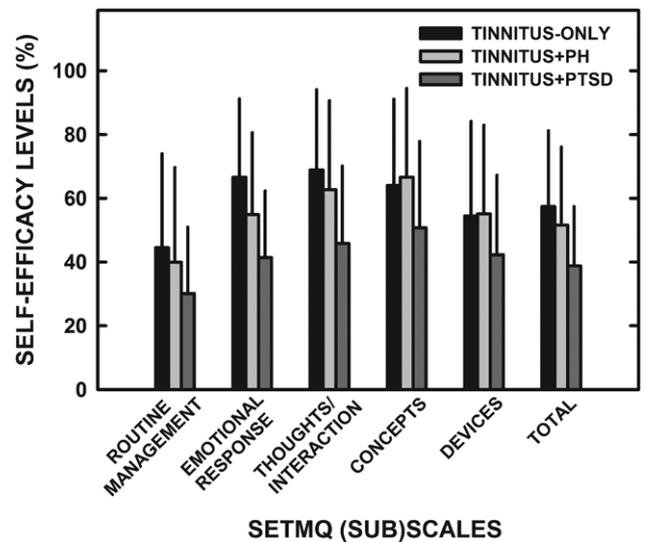


Fig. 2. Mean self-efficacy levels are plotted as a function of SETMQ subscales and total scale score for the tinnitus-only (black), tinnitus + PH (light gray), and tinnitus + PTSD (dark gray) groups. The error bars represent one standard deviation. PH indicates psychological health; PTSD, Post-traumatic stress disorder; SETMQ, Self-Efficacy for Tinnitus Management Questionnaire.

group. As seen in the figure, the self-efficacy levels for the subscales and total scale score generally appeared highest for the tinnitus-only group, followed by the tinnitus + PH group, and lowest for the tinnitus + PTSD group on all subscales aside from a few exceptions where self-efficacy levels were slightly higher for the tinnitus + PH group relative to the tinnitus-only group for the concepts and devices subscales. First, group differences on the SETMQ subscales (not total scale score that was derived from the average across the subscales) were examined via a multivariate ANOVA. The results revealed a significant main effect of group [multivariate  $F(10, 384) = 5.3, p < 0.001$ ]. Pairwise comparisons with Bonferroni corrections revealed that the self-efficacy levels for the tinnitus + PTSD group were significantly lower than the levels reported by the tinnitus-only group for all subscales and were lower than levels reported by the tinnitus + PH group for the emotional response, internal thoughts/interaction with others, and concepts subscales only ( $p < 0.05$ ). Thus, the tinnitus + PTSD and tinnitus + PH self-efficacy levels were similar for the routine management and devices subscales. The tinnitus-only group reported significantly higher self-efficacy levels than the tinnitus + PH group for the emotional response subscale only; no other subscales yielded significant differences between these groups.

A one-way ANOVA was conducted to evaluate group differences for the SETMQ total scale score (see last dataset in Fig. 2). The results showed a significant effect of group [ $F(2, 198) = 13.2, p < 0.001$ ]. Posthoc comparisons with Bonferroni corrections revealed that the tinnitus + PTSD group had significantly lower SETMQ total scores than the tinnitus + PH group (by 12.8%) and the tinnitus-only group (by 18.5%), who had similar SETMQ total scores. These findings suggest that like the other tinnitus perceptions, individuals who suffer from tinnitus and concurrent PTSD rate their overall tinnitus self-efficacy as poorer relative to the individuals with and without a PH problem other than PTSD.

## DISCUSSION

In this study, we sought to examine the influence of psychological state on tinnitus perceptions, and in particular on tinnitus self-efficacy, in individuals with chronic tinnitus. Despite the findings that all groups had similar ratings of tinnitus loudness and the percentage of time that they were aware of their tinnitus, the tinnitus + PTSD group had significantly higher scores than the other two groups on the THI suggesting they rated themselves as more handicapped by their tinnitus. Similarly, despite the equivalent audiograms among the three groups, the patients with tinnitus and PTSD rated their hearing loss as more severe relative to the other two groups. In addition, patients with tinnitus and PTSD also rated hyperacusis as more severe than those tinnitus patients without PTSD. These results corroborate previous reports that patients with PTSD and concurrent tinnitus exhibit unique debilitating effects compared with patients with tinnitus alone or to those patients who have tinnitus and other PH conditions (Hinton et al. 2006; Fagelson 2007). The results of this study extended these findings to tinnitus self-efficacy as we found that individuals with tinnitus and concurrent PTSD reported significantly lower tinnitus self-efficacy than other groups of tinnitus patients.

Not only did patients with tinnitus and PTSD report lower self-efficacy overall and for each SETMQ subscale relative to the tinnitus-only group, the tinnitus + PTSD group also reported lower self-efficacy on subscales for the internal thoughts and interactions with others, tinnitus concepts, and the emotional response subscales relative to the tinnitus + PH group. This finding supported the notion that individuals with tinnitus and PTSD, relative to the other two groups, had lower confidence in their abilities to (1) maintain a positive self-image despite their tinnitus, (2) trust that their senses were reliable, (3) interact with others in their society, (4) understand that their tinnitus was a sound experience that was independent of hearing loss severity, (5) think about their tinnitus as a neutral sound, and (6) manage the emotional consequences of their tinnitus. Therefore, although psychological disorders have been shown to influence tinnitus severity ratings, the patients with concurrent PTSD also lacked confidence that they could manage the effects of tinnitus. Such patients manifested this difference as reduced self-efficacy and more negative tinnitus perceptions than patients with depression, anxiety, and other conditions known to exacerbate tinnitus reactions. The low self-efficacy among PTSD patients was consistent with reduced ability to manage chronic health problems, of which tinnitus would be an example, but as Schnurr and Jankowski (1999) point out, not the only example.

When comparing tinnitus self-efficacy between the tinnitus + PH and the tinnitus-only groups, the only group difference was found on the emotional subscale. Therefore, and not surprisingly, patients with tinnitus who also have a PH condition may find themselves less confident in their abilities to control the emotional response to their tinnitus. Otherwise, they exhibit similar self-efficacy beliefs in their abilities to manage other aspects of their tinnitus relative to individuals who have tinnitus and no PH condition. Of course, the need to address and control emotions associated with bothersome tinnitus is well established and essential to successful tinnitus management.

Two study limitations are noteworthy. First, responses from the participants in the tinnitus + PTSD group suggest those individuals are most disturbed by tinnitus, and believe themselves to be least capable of managing tinnitus effects, across all tested domains. This

finding must be balanced by the observation that self-report tinnitus ratings of patients with PTSD on the test items provide limited information about the patients' beliefs and perceptions, particularly with single-item self-report questions. Although the patterns of responses distinguishes patient groups, the responses on their own do not identify mechanisms nor explanations for the patients' perceptions. PTSD is a complex psychological injury (Shay 1994; Herman 1997) that cannot be quantified easily or unequivocally. While the subjective ratings provide an opportunity to compare groups, they do not identify causative mechanisms underlying the group differences.

Another limitation of the present study relates to the patient group sampled. All of our participants are Veterans, and the vast majority male. It is not clear whether these results would generalize to a mixed gender population, or a majority-female group. Although PTSD diagnostic markers are the same for civilians as for those associated with military veterans (American Psychiatric Association 2013), the influence of a patient's traumatic associations on tinnitus perceptions and beliefs may be different, at least in some cases, when the traumatic exposure is related to military service. Therefore, it cannot be stated that all individuals with tinnitus and histories of traumatic exposures would express the effects of their tinnitus in a manner similar to our patient groups.

Despite these limitations, it seems plausible that interventions focused on increasing the confidence an individual has in managing chronic, debilitating tinnitus could result in a reduction in the negative sequelae secondary to tinnitus (e.g., Henry et al. 2008; Smith & Fagelson 2011) for all patients. As the data suggest, however, improving overall tinnitus self-efficacy may be especially important for patients suffering from tinnitus and concurrent PTSD. For patients with tinnitus and a concurrent psychological condition other than PTSD, there is likely much benefit to be gained from interventions that also focus on improving patients' abilities to control the emotional reactions produced by tinnitus. In this context, the current applications of self-efficacy principles as an element of progressive tinnitus management (Henry et al. 2008) or CBT interventions (Cima et al. 2012) suggest that the measurement of self-efficacy could support ongoing and emerging clinical approaches to improve patient outcomes.

The SETMQ is one tool that may facilitate the identification of specific aspects of the tinnitus experience that the patient feels least capable of managing. With this information, the provider could tailor the intervention to address those areas in particular. Counseling, sound therapy, and other forms of tinnitus intervention could then more effectively incorporate self-efficacy enhancing techniques, which may improve management of tinnitus in daily life. A priority for future study is to consider self-efficacy more formally in interventions focusing on tinnitus management, particularly in patients with concurrent PTSD.

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